AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN & HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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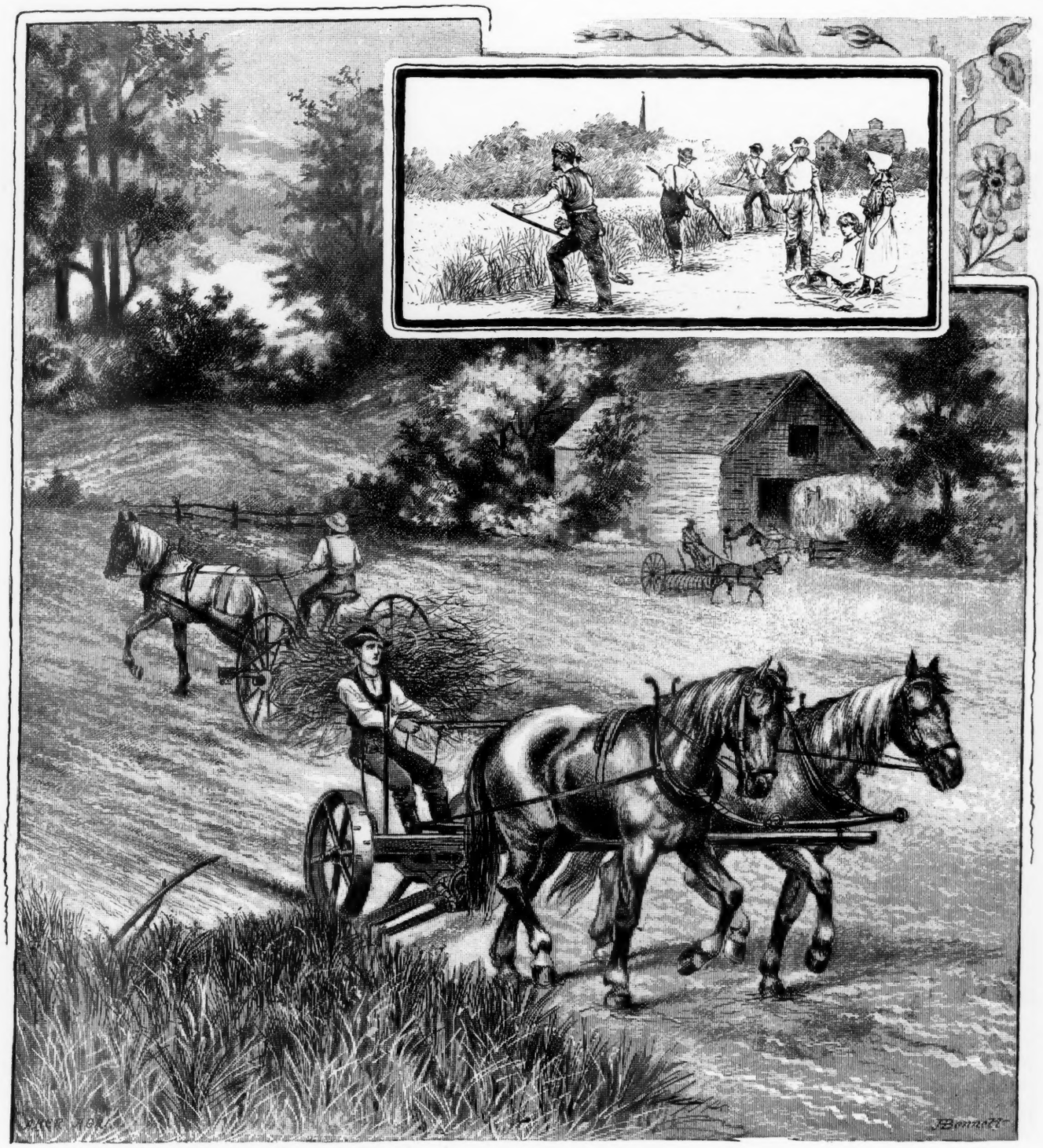

IN THE HAY-FIELD, THEN AND NOW.

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MAKE HAY WHILE THE SUN SHINES.

THE American farmer must be a prompt man. He must do work at the right time and do it well, and have done with it. Our prevailing winds come over a dry continent and are hungry for moisture, while the winds of Ireland, England and Western Europe pass over the Atlantic ocean, warmed by the gulf stream, and are loaded with moisture. Here our roads are muddy to-day and dusty to-morrow, and some people grumble and call it a disagreeable climate to live in. Nothing of the sort. It is the best climate inthe world for road making. But we must not let the roads get muddy. We must drain them. And in making hay our climate is the best, or worst in the world. Like fire, it is a good servant, but a bad master. We have seen grass in England that had been cut three weeks, and repeatedly turned, that was not wilted more than grass that had been cut here for three hours. And it did not seem to be injured very seriously. In our climate a few days of such exposure would make the hay fit only for the dung heap. Why this difference?

When grass and clover are growing the leaves and flowers are covered with a film of gum. Pull off a clover blossom and you find it sweet. If it were not for this film of gum or wax the rains and dews would wash out the sugar. When we cut the clover or grass and it dries rapidly, the film of wax cracks and then the rain can get at the sugar and wash it out. This is the one most important fact to be clearly understood and observed in curing grass. The reason why the grass that had been cut so long in England was injured so much less than we should have supposed was due to the fact that the weather was so wet and the air so charged with moisture that the grass remained nearly as green and full of sap as if it had not been cut. The film of wax was still unbroken and the rain could not get at the sugar. If we cut a field of clover, and rain immediately follows, before the clover wilts, no harm is done. But if the clover is partially cured and is then allowed to lie out exposed to the rain or even to a heavy dew, much loss of sugar and other soluble matter will be sustained.

Our own plan of curing clover or a mixture of clover and grass is to start a couple of mowing machines in the afternoon, and not touch it until next morning. While it is green the dew in the night will not injure it, and if it should rain in the night or the next morning little or no damage will be done. It is better not to touch the hay until there is a chance of getting it dry enough to put into cock. Fortunately, as soon as the rain is over and we have a clear sky and a brisk wind the hay will dry with wonderful rapidity. We want no eight-hour men on such a day, unless they do not commence work before noon. The hay must be got into cock before one leaves the field. It is then, if the cocks are well made, comparatively safe. We like to get hay in without rain. If it is not cut too early and has not been injured by rain or dews, it is astonishing how green it can be put in the mow without injury. The richer the sap the better it will keep. A few days of sharp fermentation will do no harm. The heat generated will kill the microbes, and decomposition will stop.

It should be remembered that there is quite a difference between internal and external moisture. Ordinary green clover or grass, when cut, contains seventy-five per cent of water. In other words, a ton of grass contains 1,500 pounds of water and 500 pounds of dry hay. A ton of dry hay, when growing, contains 6,000 pounds of water. It is not necessary to get rid of all this water. If 5,000 pounds are evaporated, the hay as put in the barn would contain thirty-three and one-third per cent of water. If the heat generated in the mow evaporated 500 pounds more water the hay would then contain twenty per cent of water. This is a little more than hay as sold or fed out usually contains.

Overcuring.—Much hay is overcured. It is exposed to sun and air until it becomes dry, hard, and brittle, and the handling necessary to get it to the mow and then to the animals loses a part of the most valuable portions, and it is less digestible and palatable than if it had only the proper amount of curing. This overcuring is not necessary to the proper preservation of the hay. If the hay is stored in good mows, or even good barracks, it may be placed in them while the grasses have a decided green tinge, and while clover has a slight greenish tinge. It is impossible to describe in words the indications of the proper condition for storing. Each farmer should experiment by storing each year a small quantity not so well cured as he has heretofore made his hay, noting carefully the condition when stored and the condition when fed. In this way the least necessary curing may be determined. It should be considered that overcuring, by keeping the grass longer in the field, increases the chances of its being rained upon. In fact, more hay is damaged by rain falling during the last two hours it was designed to have it in the field than by the rain during the preceding hours.

FACTS AND "FANCIES" IN SILAGE.

JOHN GOULD, OHIO.

"Has anything new been found out about silos the past winter?" asks a reader of the AMERICAN AGRICULTURIST. Not exactly, but many previously advanced ideas have been confirmed and the "faith of the saints strengthened." Speaking for myself, I think that some things have been made plain, and in the future we shall agree upon a few fundamental points. That the stone silo—except under limited circumstances—has had its day, and has ceased to be written about in silo literature. The lathed and plastered silo is now seldom mentioned. Its great advocate, Prof. Cook, of Michigan, now is on record for the wooden-lined silo, made durable with a coat of gas tar and gasoline.

The contest is now between a silo with a lining of two thicknesses of cheap, sound lumber, single surfaced, not even matched, put on with a half lap, with tarred paper between to make the walls doubly air tight, and the silo with a lining of a single board, —good flooring—matched, and not painted, the idea being that the lumber dries out during the summer, and when the silo is filled the swelling forces the joints and seams in the matching all close shut, and the silo lasts for years. The problem is just this! Will a silo made of one thickness of high-priced flooring be better than a double lining of cheap lumber, but sound? Will the single ceiling continue to swell on demand, and always make a close air-tight matching?

It appears that a ten- or twelve-inch timber, well seasoned and thoroughly painted with gas tar, especially at the ends, and sunk in a trench, and bedded in with lime cement, is, when no "building up" is necessary, and where there is good natural drainage, quite as good a foundation as one needs for a silo. The trench is just large enough to take in the sills, and the cement fills in between the sills and the soil. The studding should not be mortised in, but toe-nailed with 16d- or 20d-wire nails. If fears are entertained of surface water, a two-inch tile sunk in the outside corner of the trench before putting in the sills will remedy this. That a grouted floor, or cement is necessary is doubtful. Well-pounded-down clay makes an admirable floor. The only objection is that rats come up from underneath sometimes. The remedy for this is a good ferret for an hour. If a coat of gas tar and sand is first used under the clay floor rats will not mine the silage.

Fast filling is now, when help can be obtained, generally recommended. Corn thinly planted and cultivated very shallow to induce earing, and allowed to stand until "out of the milk," before cutting, and then filled in without wilting, seems the material out of which sweet silage is made. Filling with whole fodder, now that some of the conditions of that process are understood, has many friends. The smaller kinds of corn must be used, and the silo filled as the corn begins to glaze. The corn fodder should be laid all one way, tops and butts. The tops along the walls should be broken over, and in the corners green hay should be occasionally put to keep them full and air proof.

How to cover a silo is a matter upon which few silo men agree. The successful cover of last year is no better this year than no cover. As a rule, cover as we may, some of the surface silage will spoil. The silage left without a cover rarely has more spoiled silage than the one that has been protected with a tight-fitting cover. Two of my silos the past winter, covered alike and the same day, gave different results. In one there was about thirty bushels of loss, in the other seventy-five bushels, while a neighbor who covered his silo with six inches of green hay lost no silage but did lose the hay. Seventy-five bushels of silage would have a value of seventy-five cents, the half ton of hay was worth $3.00. For the little loss of silage how much compensation do we receive for the outlay of material and labor?

What material has proved best for silage is answered: Corn every time. Clover may be a close rival, but farmers, as a rule, do

not succeed nearly as well in siloing it as they do with corn. There are things about clover not so perfectly understood. Some farmers think that the secret of good clover silage consists in cutting in full blossom, not allowing it to wilt, and putting it in the silo without treading. Like corn it needs all the air possible to start the heating uniformly through the mass. The cause of corn molding in the silo is overtreading, and forcing out so much air that there is not enough left to carry on the heating to the 120° point, and mold sets in because of this lack of air to complete the work of ferment, or germ killing, whatever the process may be.

CANE SUGAR PROSPECTS WITH BOUNTY.

THOS. MANN CAGE, LOUISIANA.

From the description of cane culture, etc., in Louisiana in previous articles, the inference might be drawn that large capital and costly structures were absolutely necessary for the production of sugar, yet such is not the case. To-day, even on the Teche may be seen the newly erected Central factory, where they crush from 500 to 600 tons of cane per day of twenty-four hours, and further up the bayou are sugar houses of smaller capacity, until one arrives at the primitive horse mill, such as was used fifty years ago when the industry was in its infancy. The one with an output of from 80,000 to 100,000 pounds of sugar per day, and the other perhaps from 2,000 to 3,000 pounds. Owing to the scarcity of wood, and an abundant water supply, both essential but not to be had in adequate quantities in *ante-bellum* days, in some portions of the State where cane can be grown, it was not cultivated. But with railroads and driven wells there is no reason why immense quantities of cane cannot be grown. New experiments made within the last two or three years demonstrate that it can be successfully cultivated on the uplands. There are many portions of the State well adapted to small farmers, where the land is easily cultivated, and where it is not necessary to incur the expense of extensive ditching. The lands are somewhat rolling, and they are beyond the belt of the rainy seasons of July and August which prevail in the more southern parishes. Another reason why those lands were not cultivated in cane in the past is that sugar producers imagined that canes must ratoon (propagate from year to year from the stumps left in the ground from the previous crop) for a term of years; but the progressive planters of the tropics have largely abandoned the cultivation of old canes, and now resort to more frequent plantings.

It is becoming a recognized fact that small farmers and good tenants till more land, and can produce better yields of cane and corn than where the crops are cultivated by gang labor on large plantations. An instance will suffice to show what can be accomplished even in the lower parishes in a good season. Three men and four mules cultivated about 100 acres of land, and made 930 tons of cane, 935 bushels of corn, 250 bushels of sweet potatoes, and eighty barrels of rough rice. When the lands are easily cultivated and the work can be performed with the single plow and sulky cultivator, four industrious men and six mules might cultivate the above amount under ordinary circumstances, yet it would not be advisable to undertake a larger amount. With such a quantity of good land, 1,250 tons of cane could be made under favorable circumstances, and 140 pounds of sugar be had per ton of cane with a powerful mill, although small. There are outfits to be had at a cost of about $150 by which 1,000 pounds can be made per day. Good marketable brown sugar can be made by the process, and molasses of excellent quality. The 100 acres should produce all the forage required for the stock, as one-third of the land should be in corn each year, and hay made from the peavines grown therewith, and the vegetables, etc., necessary for the family.

The climatic conditions which prevail during the entire year are favorable. Intense cold is not known; snow rarely falls, and soon disappears. Excessively high temperatures are not experienced, and the thermometer rarely registers above 94°. Field work commences early in the year and the cultivation of corn and cane is generally brought to a close about the first of July. The corn and hay harvest begins from the middle of August to the first of September, and sugar working begins in October, and should be brought to a close before the end of the year.

Our rapidly increasing population and the augmentation of *per capita* consumption of sugar will insure a demand for every pound of sugar produced in the country. Our planters are rapidly learning how to increase acreage yields, not only by superior skill, but also by improved methods in manufacture. Yields are rapidly approaching those obtained in Cuba and elsewhere, through the instrumentality of better tillage, the use of fertilizers, and improved machinery. For the last twenty-five years the industry has been very much retarded by tariff agitation which has always rendered capitalists very timid. The values of sugar have also gradually declined during that time, due to the increased production of beet sugar in Europe which has been brought to its present gigantic proportions by the fostering care of the different governments. The areas adapted to beets in Europe are somewhat limited, and production cannot be very greatly augmented.

The probable output of the crop now being made in Louisiana, is 200,000 tons, but let confidence in the bounty be thoroughly established, and in three years it may be 300,000 tons. The influx of farmers of means will materially augment production, and at no distant day the erection of Centrals in desirable localities throughout the sugar parishes (which will also stimulate cane growing) will increase the tonnage yield of sugar from thirty to fifty per cent. At present nearly one-half the sugar in the State is made in antiquated sugar-houses where not over 100 pounds of sugar can be had from a ton of cane containing 200 pounds of available sugar. Capital must be had to provide Centrals where all the available sugar can be produced. To accomplish this those who have it must feel assured that they are to be the recipients for a term of years of two cents per pound on all sugars of 90° test, and one and three-quarter cents per pound for those polarizing 80° and below 90° to pay for the expensive buildings and apparatus, and leave a margin of profit after paying the producers of the canes a reasonable price for the raw material. The small producer will not only get the market value of his sugar, but will be the recipient of at least one and three-quarter cents on every pound of sugar above five hundred. The increased interstate commerce, and the retention at home of the major portion of the many millions now annually sent abroad to pay for foreign sugar, will ultimately prove a source of great national wealth, and more than compensate for the amounts disbursed to pay the bounty on sugar produced not only from cane in Louisiana, Florida, and Texas, but from sorghum, and beets in the North and West.

IMPROVING INDIAN CORN.

I. J. FARMER, IOWA.

The culture of Indian corn is destined to play a yet more important part in the economy of farming than it has done before. Each year the system of feeding stock becomes more scientific, as must follow in the sharp competition of breeders, and dealers in meats. Each year there will be a more anxious inquiry as to kinds and varieties of corn, ways and systems of planting and culture, and methods of harvesting and securing. There will be extensive farm experiments to improve the present expensive way of cutting and "stooking" corn, husking, and getting the grain before the animals. There will be much well-directed effort in feeding the stalks to get best results from the whole crop.

These efforts will be along the line of not separating stalk and grain, and instead of spending one-fourth of the value in husking corn and grinding meal, grow such kinds of corn that are best adapted to the purpose, and feed the stalk, husk, and grain, together. In this I think we shall make great improvement in the future. As planted by the unskilled farmer, corn has a struggle to maintain its average standard of excellence. Not one farmer in ten thousand makes any attempt to better his corn by methods of culture in harmony with the nature of the crop, or improve it according to the laws of breeding, that with the plant are not greatly different from those in animals. Promiscuous selecting of seed (that is of all degrees of vitality, from good to that too poor to germinate, and so on through the list) must be abandoned. Barren stalks and defective ears of grain are, I believe, more often the result of improper fertilization than that of accident. Seed from an ear of corn that was fertilized by the pollen of an earless stalk would, in the nature of things, be very likely to multiply the number of barren stalks. I am sure that we need to do three things in improving our corn crop, and make them conspicuous features of our plan of corn growth: Breed our crop of seed corn separate and apart from the general field, dry our seed corn in the fall and not let it become frozen during the winter, and make it a law of no violation that in culture the roots of the corn must not be disturbed. Root pruning must be avoided. Every root cut off retards growth and delays maturity by so much, and in dry weather cutting roots is a serious injury.

It is no great task to plant a small plat of ground with corn, and, as its growth progresses, cut out all puny and defective stalks, and

those that do not promptly show their silks. Then before the pollen falls cut off the tassels from half the stalks. This produces cross-fertilization of the plants and eliminates the chance of any influence of pollen from barren stalks upon the seed ears. The seed corn should be saved for a series of years from the stalks with the severed tassels. Prof. Roberts has by this plan in two or three years added fifty per cent to the productiveness of corn over the ordinary way of growing and saving seed. It is in the line of progress. Like produces like, and if all the conditions are observed an improvement must take place, as there are no hindering influences to retard. That well-saved seed corn is better than poor or uncared for seed is self-evident; that two-thirds of the cultivation of corn can be given to it before it is planted is quite as true. Making the seed-bed fine and worked to the bottom of the furrow is the best plan, and when so fitted it should be allowed to remain undisturbed as well as the corn roots that are all through it.

Shallow surface cultivation well performed is far better than deep plowing and ridged land between the rows. All hilling should be avoided, using instead of a plow slanting toothed harrows, and finishing with easy-going cultivators. Kill the surface weeds, but do not "lay the corn by" with a final deep run of the cultivators and bring up a fresh crop of slumbering weed seed to the surface to germinate. When the corn is well cultivated stop and let Nature have a chance.

POULTRY IN THE SOUTH.

H. S. BABCOCK.

In traveling through the South one finds advantages and disadvantages for poultry raising. The advantages are a climate that enables chickens to be hatched nearly the whole year through, that makes the construction of poultry-houses inexpensive and enables the breeder to have the most thorough ventilation without danger of frozen combs, colds, and such ailments as spring from exposure to severe weather. The disadvantages are greater liability to chicken cholera, which often destroys whole flocks, a lack of grass, that is of such an advantage in the rapid development of growing fowls, and the scorching rays of the sun, which discolor the plumage of some varieties. A skillful physician in Augusta, Ga., informed me that strychnine, about one-fourth of a grain to each fowl, administered in the drink twice a week, was a sure preventive of cholera. Wheat, barley, and other grain foods can be grown to take the place of grass, and alfalfa and blue grass in many sections, with a little care, can be cultivated. The advantages, therefore, greatly outweigh the disadvantages, and the South can justly claim that it is the best region in the country for the production of poultry.

Southern breeders are behind those of the North and East in the production of high-class fowls. There are, of course, many exceptions to this rule, but, speaking "by and large," this statement is true. But the interest in thoroughbred poultry is increasing yearly, and, if this continues to increase as rapidly in the next five years as it has in the past five even New England, the center of thoroughbred poultry, will have to look after its laurels. At present there are certain breeds and varieties in which the South can scarcely be excelled. The Pit Game, though bred primarily for a purpose that Northern breeders cannot approve, is a beautiful and useful fowl. Many of the specimens are of good size, fine shape, plump build, beautiful color, and are said to be prolific layers. The Langshan is taking a strong hold in this section of the country, and better specimens it is difficult to find than are possessed by some of the Southern breeders. Black fowls do exceedingly well in the South, and seem to bear its climate better than those of almost any other color. The Hamburgs—especially the Silver Spangled—are bred to great perfection, the finest male bird of this variety which I have seen this season being a Southern bird, bred from Southern birds by a Southern exhibitor. The Silver Wyandotte, also, is a very popular fowl in the South, and the very best class of fowls of this variety which has appeared at any exhibition last winter, I think, were shown at Augusta, Ga., by Georgian and South Carolinian exhibitors. Southern exhibitions are particularly strong in turkeys, ducks, and geese, nearly every breed being represented by specimens of the finest quality. Few, indeed, are the Northern exhibitors who can bring together such fine specimens as are found at nearly every Southern show. The Muscovy duck seems to be an especial favorite, and specimens remarkable alike for size and brilliancy of color are of frequent occurrence. The Pekin duck, though bred to very good size, is not the equal of birds shown by certain New England and New Jersey exhibitors.

The South is buying liberally of the North at present, and shows a thoroughly progressive spirit. It is determined to have the best fowls that money can buy in order to avail itself of its natural advantages and take the position in poultry rearing which seems to be rightfully its own. Although at present it is a good market for Northern breeders, by and by it is going to be a formidable rival in the production of many varieties. New England will, through its climate and soil, probably always enjoy a natural monopoly in Light Brahmas and Barred Plymouth Rocks, the great West may in a similar manner remain the headquarters for such a variety as the Buff Cochin, but in such breeds as the Java, the Langshans, the Wyandotte, and the Game, the South will probably, not many years hence, be in a position to furnish its breeders with as good stock as can be purchased North, and perhaps supply Northern breeders with the best specimens procurable. The outlook for poultry rearing in the South is certainly very promising.

POULTRY POINTS.

JOHN W. CAUGHEY, PENNSYLVANIA.

Hens that lay white eggs as a class lay as many as those that lay eggs of other colors within the year, but not as many in the late fall and winter months, without special care, and in cold weather eggs always bring higher prices and when the profits are much greater. Most white skinned fowls lay white shelled eggs.

It is a good plan to feed a little oil meal in the morning or at noon with the soft food; about once a week will be sufficient. It will act gently on the bowels, glossen the plumage and is really a useful food to give a flock occasionally. It is also a valuable feed for cattle, horses, sheep and hogs, and no good farmer should be without it.

There are no two breeds that have so firm a hold on the breeders of America as the Brahmas and Plymouth Rocks. Those who keep fowls for profit and those who are compelled to satisfy their tastes inside the most practical breeds invariably keep the Brahma or Plymouth Rock; the demand will naturally be greater for these two breeds.

The broiler industry, the rearing of roasters and capons, and the egg farm are in their infancy. Their growth is going to be rapid. When this demand has really begun to be felt, the breeders of special purpose fowls will not want for orders. The demand for India Games, Dorkings, Leghorns, Minorcas, Red Caps and similar fowls is growing, and the breeders of these varieties are increasing with great rapidity.

It is always advisable to select large, well-formed eggs whether intended for raising chicks by incubator, or under an old hen. Finer chicks cannot fail to hatch under ordinary circumstances from well developed eggs than from those formed in contracted egg passages. Rich brown and dark salmon in females, and rich red in males are points to be sought, with wing primaries of solid color in both sexes, if possible avoiding the edging of yellowish brown.

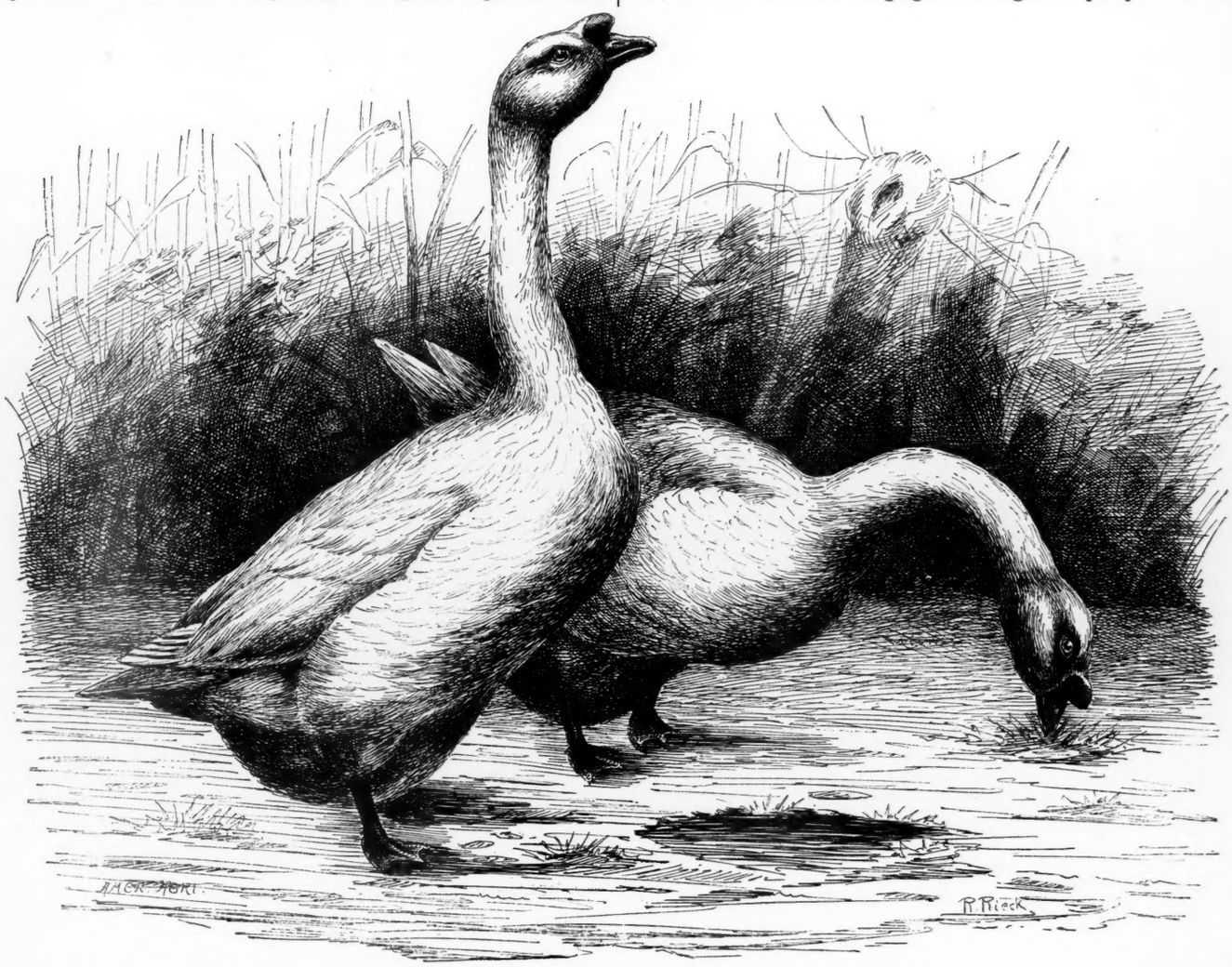
The expense of maintaining a few thousand lice through the winter, and their invincible millions of progeny through the summer is incalculable, for if the fowls are not killed outright by their ravages, these wee parasites still insist on drawing their support from the vital forces of the bodies of their unfortunate victims. The louse-encumbered hen therefore requires not only food for her own sustenance, but a surplus to offset what she furnishes to the lice. Keep your hens clear of them.

To hatch chicks or ducks for broilers necessitates the use of an incubator. Although hens may be used to hatch them, it would not be very profitable, especially on some of the broiler farms we read of. But to hatch the ducks for a breeding flock only, with no intention of selling at nine weeks old, the hen may be used, and when hatched place them in a brooder, which is preferable, as ducklings do not require brooding as long as chicks, and the hen may go about her business again, laying eggs.

The ideal fowl is a very practical sort of a bird. One that is plump, fine flavored and quick of growth, this is what any one wants in a broiler—a good roaster with heavy breasts, tender flesh. As layers we want hens that will begin to lay when six months old, that will lay eggs two ounces each in weight, with rich yellow yolks. Every hen should lay at least one hundred eggs and rear a brood of chicks the first year and a half of her life. This is not wanting too much, but there are many fowls kept on the farm that fail to come up to what constitutes good, practical stock. It is a poor policy to retain poultry which does not return an equivalent for its feed.

WHITE CHINESE GEESE.

Of all the breeds of domestic geese the most graceful is the Chinese, and in this respect it has but one rival, the Canada or, as it is popularly called, the Wild Goose. The head of the white Chinese goose is rather small; the bill is orange colored with a large knob of the same hue at its base; the neck is long, slender, and gracefully curved; the back shows a slight convexity along its upper surface; the breast is round and moderately full; the body is small, round, but very plump; the wings are large, well developed, and folded smoothly against the body; the feathers of the tail are stiff and hard; the thighs are short and well-filled out; the shanks are shortish, rather longer in proportion to the size of the fowl than those of the Toulouse or Embden; and the carriage is exceedingly graceful and swan-like. The plumage throughout is spotless white, the beak, knob, shanks and feet are orange in color, and the eyes are usually of a bluish cast.



PAIR OF PURE-BRED WHITE CHINESE GEESE.

Of the two varieties of Chinese geese, the white and the brown, the former is generally regarded the more beautiful, for a plumage of immaculate white always looks attractive upon the water, or upon the grassy edges of a lake or stream. The contrast between the blue of the water or the green of the grass and the white of the plumage is exceedingly pleasant to the eye. Geese, by their frequent bathing keep their plumage clean, and the objections which apply to the ordinary domestic fowl with a white plumage have no bearing upon white geese.

In size the Chinese are the smallest of the domesticated breeds of geese, not exactly Bantams among geese for their weight is too great to be so considered, but very much smaller than the lumbering Toulouse, or the heavy Embden. The keel of the Chinese goose does not drop down so low as that of the heavy breeds, and the gait is, therefore, less waddling and awkward. But though smaller than the other breeds, the Chinese are none the less profitable to keep. Size and profit, even in fowls like the goose, are not convertible terms. Their smaller size makes less demands upon the grain bin for growth or fattening, and from the same amount of food an equal or nearly equal weight of Chinese and Toulouse goslings can be produced. And, inasmuch as the Chinese geese will bring the same or nearly the same price per pound in the market as other breeds, the profit to be realized from the dressed poultry is about the same in all breeds, large or small. But even granting that the Toulouse or Embden geese will make more weight for the same amount of food, and bring more per pound for the weight made, it does not necessarily follow that they are more profitable breeds to keep than the Chinese, for the latter are vastly better layers, and will produce nearly or quite twice as many eggs in a season as their heavier competitors. The feathers of the Chinese are equally valuable, the white feathers bringing something more per pound than the colored. For those who have suitable accommodations—a good pasture and clean water—geese are profitable fowls to keep. In the summer they gather the greater part of their living and require but little grain until ready to be fattened. The fattening process is a short one, two weeks of liberal feeding usually being sufficient. The income from feathers, eggs, and flesh will show a handsome balance on the credit side of the account. But it is not desirable that they should have free access to meadows, for a flock of geese will tramp down and otherwise injure enough grass to seriously diminish the profit that should be derived from their keeping. For this reason not a few farmers who have kept geese believe them to be very unprofitable poultry, whereas the lack of profit was due not to the geese but to the mismanagement. Properly managed, there are few kinds of poultry more profitable than geese, and among geese there are few, if any, varieties more profitable than the white Chinese. Our illustration was made from life of the prize pair at the recent Madison Square Garden Show and clearly exhibits the characteristics of this handsome variety of geese.

CONVENIENT HOUSE FOR ONE HUNDRED AND FIFTY FOWLS.

Where a large number of fowls are kept on the farm, the hens are commonly kept in flocks much too large to secure the best results, and are housed in inadequate quarters. Where one hundred or one hundred and fifty fowls are kept, a structure as shown in the illustration will be found to economize material in building, and labor in caring for the occupants. The plan is designed for a low building forty-five feet by twenty-four, divided into pens ten by fifteen feet, with a walk four feet in width extending the whole length. The five compartments allow the whole flock to be divided into small flocks of thirty each—a number that will give better results than could be obtained if more were added. Having pens

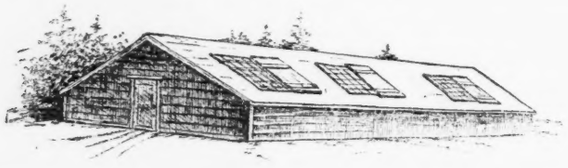


FIG. 1. PERSPECTIVE VIEW OF POULTRY HOUSE.

on both sides of a walk economizes space and gives access to each flock without moving out of the building, which in stormy weather will insure the fowls much better care. The feeding, watering and also gathering of the eggs can be done from the walk if desired, and most persons will prefer such an arrangement, as it renders the work more cleanly and expeditious. The posts of the building should not be over four feet, and the peak of the roof not more than seven and a half, or eight feet from the floor of the walk. A high building cannot be kept warm in winter. The structure should be built, if possible, to extend northeast and southwest, if it is situated in a cold climate, so that the sun may shine in as early as possible on winter mornings. It is lighted by three sash windows in the roof, so that the sunlight may fall into the pens on each side of the walk, which would not happen if the windows were placed in the south wall. Tight board shutters are hinged to the sides of these windows, so that they can be closed on cold nights, thus keeping the heat within from being radiated through the glass. The sashes can be removed in summer, and the shutters closed to within six or eight inches to keep out the sun's rays and to afford a free circulation of air. Such a building will be much warmer in winter if built upon land slightly sloping toward the south so that some excavation can be made, making the posts upon the north side two feet, perhaps, in height. Good drainage would, of course, be essential in such a plan. The yards in the front and rear should be as large as they can well be made, as fowls do not like closely-restricted quarters.

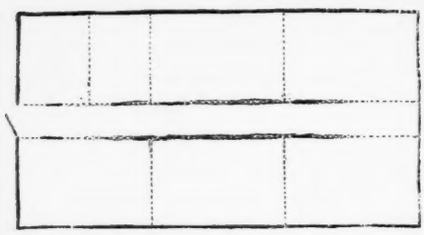


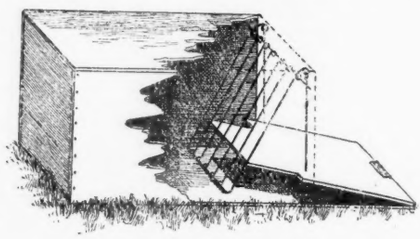
FIG. 2. GROUND PLAN.

Fig. 1 shows a perspective view of the chicken house, while Fig. 2 presents the interior plan. The two small rooms at the upper left hand corner are intended for storing grain and other necessaries.

TRAPPING RABBITS.

JOHN C. UMSTED, KANSAS.

Rabbits are quite numerous here, and if allowed to increase without molestation become a nuisance to the farmer and fruit grower. To diminish this pest I use a trap (a sketch of which is shown herewith) which proves quite satisfactory, and as it requires no setting or baiting the time taken to attend to it is reduced to a minimum. To make the trap use six-inch pine fencing boards. Cut three boards two feet long, one board two feet nine inches long and one eight inches long. Make a box of the first four boards with the ends all even at one end of the box and nail the eight-inch block on that end. This box must be put together so that the aperture shall be four inches by six inches. For the treadle take a shingle, cut as seen in the illustration, of a size to fit the projecting bottom and fit loosely in the trap two inches. Hinge the broad and projecting platform of the box with a bit of leather. Make the door of No. 12 wire. The axis should have loops one inch apart. Take another piece of wire, run one end through the loop, give it a turn about the axle, and then form a loop about one-half of an inch above it. Then bend the remainder of the wire about the border of the door, making loops in the bottom one inch apart, running the end up and finishing like the other end. To hang the door put the lower end in the trap so that it will start inward. Be sure the door is low enough down to work easily and freely to the roof of the trap. Then take a short piece of fine wire and connect through holes in the treadle with the loops above the axis. These wires must be short enough so that when weight is applied to the treadle it will raise the door to the roof. If the treadle is found to be too heavy for the door the loops above the axis extend too far outward, which can be remedied by bending toward the trap. See that the door works easily and freely without catching on the sides, and it is ready to set or place where the rabbits will find it. In trapping rabbits do not set the traps immediately in their runways, but to the side, with the open end toward them. If twigs have been bitten off by the rabbits set a trap there. In traveling from place to place rabbits usually take the lowest ground along little branches, or even shallow hollows one or two feet below the general surface, so along these are good trapping grounds, also along fences, hedges, around the orchard, under clumps of dense bushes and brush heaps. Usually rabbits do not go into a trap the first night it is set. The weather has a great deal also to do with trapping. Sometimes I do not catch a rabbit for nearly a week, while at other times I get half a dozen a day. Baiting the traps will only colonize them with mice. Rabbits go into them for shelter and to secrete themselves.



A KANSAS RABBIT TRAP.

IMPROVED FORM OF HAY-RACK.

To prevent the packing of hay in mangers, Mr. F. B. Lindsay has designed a new form of racks, of which he sends us the accompanying sketches: By packing the hay down into the wedge-shaped rack, Fig. 1, it becomes wedged tighter and tighter until by use and continued putting in of fresh hay the horses will turn from the refuse left by careless feeding; while, on the other hand, in the plan shown in Fig. 2, there is an inverted wedge, the slope not being sufficient to take up very much room in the stall. A slope of six inches from top to bottom will allow all the hay to slip down as the horse takes it out from the lower part, and no matter how tight it is stuffed at first, as it is eaten out below the hay above will slip of its own weight down to the bottom. The rack is open at the lower end, the hay being kept in by slats the same as at the sides so that the racks become almost self-cleaning. They are one and one-half feet wide at the top, and can be made as long as desired.

FIG. 1.

FIG. 2.

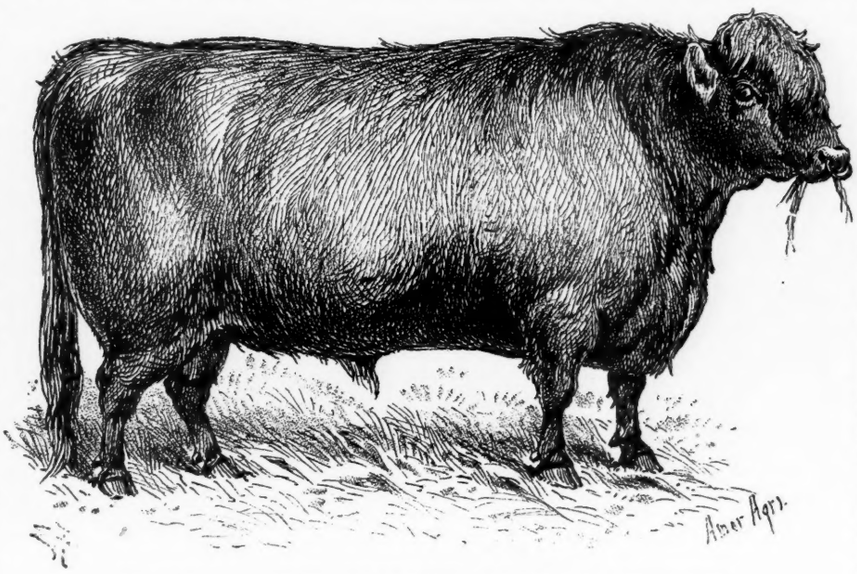
Unfruitfulness of Fruit Trees.—There are many reasons for the lack of fruitfulness in plants. A tree may fail to produce flowers, and therefore no fruit can subsequently follow. The plant may be laden with bloom and still no fruit result. In such a case it is possible that one of several circumstances may bring about the result. The pollen if defective will not fertilize the seed vessels. This is well illustrated in some varieties of strawberries that are termed pistillate because the stamens are abortive. There may be a lack of insects for the transfer of pollen from one flower to another, and the pistils fail to enlarge and develop seeds. When heavy rains come at the time the flowers are in full bloom, there are many reasons why the fruit fails. The insects are not so active, but most of the pollen grows before it reaches the proper place, just as the wheat may germinate in the sheaf, or while standing in the field during wet weather. If the pollen grows, that is, sends out its tube while in the stamen, it must fail to serve its purpose.

GALLOWAY CATTLE.

RICHARD WAUGH, MANITOBA.

The Galloway, so called from its native district in the Southwest of Scotland, is one of the very oldest of the native breeds of that country. Its champions assert that it was not a Highland Scotchman but a Galloway man who *did not* sail in the ark with Noah because he had a "boat o' his ain," and of course his "coo" voyaged along with him. For wellnigh two centuries huge droves of those black, hornless cattle were annually driven south to the English market, where part were at once sold for beef, and the rest finished in the eastern counties for the London market, where they were great favorites with the butchers because they always "killed well," and their finely "marbled" beef, under the name of "prime Scots," commanded a higher price than anything raised in England.

The distinctive features of the Galloway are a long, well-rounded body, on short, firm legs, soft, black, wavy hair, with brownish shade, "mossy" undercoat, mellow skin, hardiness of constitution, and, what is of special importance for this country, great "prepotency" or power in the male to transmit to his offspring by any other breed his own characteristics. Cases have occurred in which skilled breeders have failed to detect any difference between such crosses and pure bred animals. Their native district has an extra rainfall, but their thick coats keep out both rain and cold better than those of any other breed, and they have on this account found much favor with Western ranchers. They are inferior for stall feeding to their Northern rivals, the Aberdeen-Angus, but beat them altogether as "rustlers" in a wild country. Northwestern ranchers on both the British and American sides of the line like them very much on this account, and the want of horns makes them much better shippers to the Eastern markets, where they bring the highest price for beef. Their hides, if prepared in the Indian manner, are very little inferior to the buffalo for robes, and it will be easier to breed ten Galloway grades than one from a buffalo; in fact, though a good deal has been written about grade buffalo breeding, there has been much more promise than achievement in that direction. This breed stands alone among domestic cattle in the power to produce a robe at all approaching that of the buffalo in comfort and beauty; in fact, its glossiness beats that of any buffalo.



HARDEN—THE FAMOUS GALLOWAY BULL.

The Galloways have always been bred more for beef than milk, and their milk, though rich, retains the cream more than that of any other breed, thus being more suited to cheese than butter-making. But there are always some capital milkers among them, and at a trial made at the University of Nebraska, in 1886, it was found that a four-years-old Galloway beat half a dozen Jerseys and Holsteins on a milk record for a year, making a total of 6,978 pounds for the season. Curiously enough, the Galloways are being driven out of their native district by the far more profitable business of raising Clydesdale horses. The stout ponies there raised were always called Galloways, but, with the introduction of Clyde blood, there has been a great deal of money made in colt rearing, for which the soil and climate seem specially adapted. When a colt can be sold under two years old for over $2,000, as has lately been done in Scotland, cattle raising must go under, and it is fortunate that home-bred Galloways are turning out so well in Kansas and Missouri.

The accompanying illustration portrays the celebrated bull Harden, one of the great patriarchs of the Galloway breed. His blood is found in many of the best examples on both sides of the Atlantic. The thick, strongly compacted, lengthy, and low-set frame, the profusion of hair, which at another season would show a wavy, glossy, brown black shade, and powerful muscle, all indicate the constitutional vigor and rustling qualities of the unvarnished Galloway, of whose fitness for the Western prairies his popularity is the best possible proof.

Reports are continually kept afloat about the breeding of Galloway cows to a buffalo bull, so as to produce in the West a robe which shall come in as a substitute for that made from the buffalo itself. There are physiological reasons why such a cross cannot be successfully made, and it is not necessary. If the hide of the pure Galloway is taken at the right season and cured Indian fashion, it will produce a robe glossy, wavy, flexible and enduring, that for all practical uses is well fitted to replace that of the buffalo itself. This of itself is a strong point in favor of the breeding of the Galloway on our Western ranches.

A RELIABLE MILK TEST.

G. JOHNS, WISCONSIN.

The advent of the Babcock milk test has greatly simplified the operation of finding accurately the butter fat contained in milk. The cheapness of the apparatus and the small cost of making a test has put a new phase upon profitable dairying, and enables the dairyman to find out which are his best butter cows, and whether or not his system of milk setting obtains all the fats from the milk. It also puts a check upon the churn itself, and ascertains whether a quarter of a pound of butter escapes from the churn with each one hundred pounds of buttermilk, or two pounds. All these matters are now within the reach of the dairyman who is progressive and desires to know what his dairy is actually producing, which of the cows yield the most of it, and with what degree of accuracy the mechanism of the dairy is doing perfect work. The Babcock milk test is simplicity itself. A small flask, with elongated neck holding three fluid ounces, is provided. The milk to be sampled, whether from a single cow or an entire dairy, is thoroughly mixed, and by the means of a pipette one fluid ounce is taken and transferred to the flask. We now have the one-thousandth of one hundred pounds of milk. One ounce of sulphuric-acid is then added to the milk and agitated a moment to mix them. The acid—1.82 specific gravity—decomposes all the substance of the milk except the mineral matter and fats. This sample, with the dozen others, is put into a revolving drum and whirled for five minutes at a speed of twelve hundred revolutions or more per minute. The flasks are now taken and filled nearly to the tops of the necks with water at 200°, and the flasks returned to the drum and whirled about two minutes more. The butter fat has now all come up to the surface, and, as the necks of the bottles have a graduated scale of the per cent and tenths of per cent etched upon them, it will be seen at a glance whether this milk had 2.8, 3.0, 3.6, or 4.0 butter fats to the one hundred pounds. This percentage, owing to the sample of milk, being taken as a decimal of one hundred pounds, gives the reading in pounds as well as in per cent. Accordingly, 3.0 per cent milk means three and a fourth pounds of butter to one hundred pounds of milk, as the butter fats in the flask are free from water, and butter has about ten per cent of water. So the 3.6 per cent milk would have a little over three and three-fourths pounds, and five per cent milk would contain 5.70 pounds of butter. The accuracy of this test is demonstrated when in use at the creameries, as the results of the test and the churn rarely vary to exceed one pound in one thousand pounds of finished butter.

At the factory the test is of great value to the dairyman who has a liking for butter cows but must sell either milk by the one hundred pounds, regardless of its butter value, or sell cream by the "space" and take no note of its butter quality. Recently I tested

the milk from twenty dairies, and the butter fat contest varied from 2.6 per cent to an even 5.0 per cent, but yet both men received the same price for one hundred pounds of milk. At current prices then for butter one man received thirty-six cents too much for his one hundred pounds, and the other was paid twenty-eight cents less than should have been paid him, based upon the four per cent dividend plan. At a factory that buys milk by the Babcock test for the month of February the following range of prices were paid for one hundred pounds of milk: A received ninety-seven cents per one hundred, C $1.01, and D was paid $1.33, and at another factory the range of prices paid per one hundred pounds was from ninety-five cents to $1.36. By this plan a man is paid for what the cows produce, and only that. There is no pooling or division based upon the balance of errors. This plan puts associate dairying on the basis of individual performance, gives to each what his dairy produces, asks no man to divide his rich contribution with the deficient offering of another. It is a premium upon excellence, and an absolute check upon fraud—skimming, watering, and the like—it invites every man to do his best, and pays him for his efforts.

ABOUT RENNETS.

GEORGE E. NEWELL, NEW YORK.

In preserving rennets for factory use, dairymen should empty the calf's stomach of curds, and then blow it up like a bladder. Previous to expansion the rennet should be rubbed with salt, and then filled with air and tied it can be hung away in a dry place to cure. When the cheese industry first began to develop in this country rennets brought excellent prices, at one time retailing for fifty cents apiece; now, half of a dollar will purchase ten rennets, in consequence of which American farmers have of late years ceased to preserve this part of the calf's body when slaughtering the young creatures for their hides. This is to be regretted, as properly cured American rennet is preferable to the imported article. The imported skins, packed in small bales, frequently arrive in a badly damaged condition, owing to mold and the ravages of worms. They are generally sold under the title of "Bavarian," although many of them come from other portions of Europe, and not a few never had a bovine origin, but were derived from the digestive functions of swine, sheep and goats.

In home cheese making dairymen should either use the rennets secured from the young of their own herds, or rely on the commercial article for coagulating purposes. Probably the latter would be the most economical, and give the most satisfactory results. Commercial rennet, or "rennetine," either in fluid or tablet form, is without doubt the best way to apply it to milk to gain uniform results. Some large cheese manufacturers claim that they cannot afford to use the preparation in their factories on account of the low price they receive for their goods. This I think is a mistake. If commercial rennet is a factor in lending uniformity to the cheese product, as it surely is, no manufacturer can afford to dispense with its use. The short-sighted cheese maker sees in rennet, in whatever form it may be, merely a common coagulating agency, and as the skins are cheaper than the extract he buys them accordingly. He places about a dozen skins in four gallons of salted water, and after a day's soaking begins to use the fluid for cheese making, relying simply on his own judgment as to the quantity necessary to incorporate with a vat of milk. This partial guesswork is one thing that accounts for the variability in quality of cheese emanating from many factories, although there are other potent causes that tend to the same end. Prominent among these are the acceptance of tainted or nearly sour milk at cheese factories when it should be flatly rejected; employment of probationary or apprenticeship help where the most skilled labor is essential to the output of peerless goods; and last, but not least, attempting to make butter and good cheese under the same roof and from the same milk.

Rennet should be incorporated with milk when the latter is at a temperature of about 85°. After this a gentle stirring of the mass with a long handled dipper should be continued some five minutes. Then, a slight agitation of the surface should be kept up to drive the cream down until signs of coagulation appear, which stage of time will be governed by the amount of rennet used. In most factories in Western New York coagulation is generally sought to be effected in about ten minutes. A quick action on the milk by the infusion of a normal quantity of peptic fluid indicates that the former is overripe, or at a too high temperature. Milk will sometimes thicken in a granulated form, which is caused by stirring after coagulation has commenced. Always apply the color to milk before adding rennet, and never run any fresh milk into the vat after the latter has been "set."

HOME-GROWN FORAGE CROPS.

HOLLISTER SAGE, CONNECTICUT.

The village or town resident who has only one or two acres and yet keeps a horse, possibly a cow also (and there are thousands of such fortunate ones who read the AMERICAN AGRICULTURIST), and who wishes to get all the provender possible from his little farm for the support of animal life, cannot do better than devote it to fodder corn. Planted two by three and a half feet apart, hoed once, and cultivated by horse several times, a great yield may be secured, and the bill for hay more largely reduced than by any other process. The owner will be surprised at the mass of food obtained, the length of time it will last and the condition in which the animals eating it will remain. To receive the most pronounced benefit and make the least waste it should be cut in half-inch pieces twelve hours before feeding and placed in a tank, covered with several quarts of wheat bran or middlings, and if wet with a pailful or two of boiling water it will at meal time be almost as fresh as when growing in the field, especially if covered with a tight lid or an old blanket while steaming. Nubbins growing on the stalks—and there will be many such if the land be rich—should be picked off and ground without husking or shelling. All will be eaten.

MIDSUMMER MUSINGS.

Do not mow the lawn too closely during the hot months. Direct exposure to the sun is not beneficial to the grass roots.

This is the time that root crops suffer from drought, and weeds make headway. Keep the cultivator going and remedy both evils.

The hay should not be "cured" so much that it is sunburned. There is not much nourishment in the dry, woody stems that result from too long exposure to the sun.

A damp handkerchief in the hat, or, in the absence of that, a handful of grass or a large leaf, will do much to protect the head from the influence of the sun's rays, and will promote comfort.

Do not allow the horses to stop at the creek, either to bathe or to drink, as they come in from work. Cool them off first and then there will be no danger of injury, and both the drink and the bath will do them good.

Do not set out plants, as celery and late cabbage, during the heat of the day. Get a better force of hands and go at it the latter part of the afternoon. It will prove the cheapest way, even if you have to pay more for the labor.

If digging any potatoes for market now, do not leave them lying in the sun to turn green and spoil both appearance and quality. Put them in boxes or baskets at once and keep covered until they can be carried to cellar or storehouse.

Carry a lemon in the pocket while in the hay or harvest field, and take a little of the juice occasionally. It will relieve thirst better than water, and is much more healthful. One should not drink cold water copiously when overheated.

Mulch the peas heavily between the rows and so keep the moisture in the soil, if you wish to have them nice in July and August. Also, have the mulch of clean straw, so that the vines may fall over on it, the pods keep clean, and mildew remain afar off.

Never attempt to fatten the pigs while the mercury is up about the nineties. They will be warm enough without the feeding of heating foods, and besides, it is easier to make increased weight by growth rather than by laying on of fat in very hot weather, as it is likewise in midwinter.

If there are any weeds in the lawn that you are especially desirous of killing, but which have heretofore proved obstinate, cut them off just below the crown while the weather is hot and dry, and let the sun do the rest. This treatment is almost as effectual with weeds as with grass.

If you find the shade of a tree is grateful these days, consider it as a reminder that you should be planting others next fall or spring. Shade is good not alone for you, but as well for the stock that stands unsheltered all day long in the open pasture. Plant a row of shade trees along the edge of the field that is next the road and get the blessings of the traveler and of your own cattle, and beautify the farm as well.

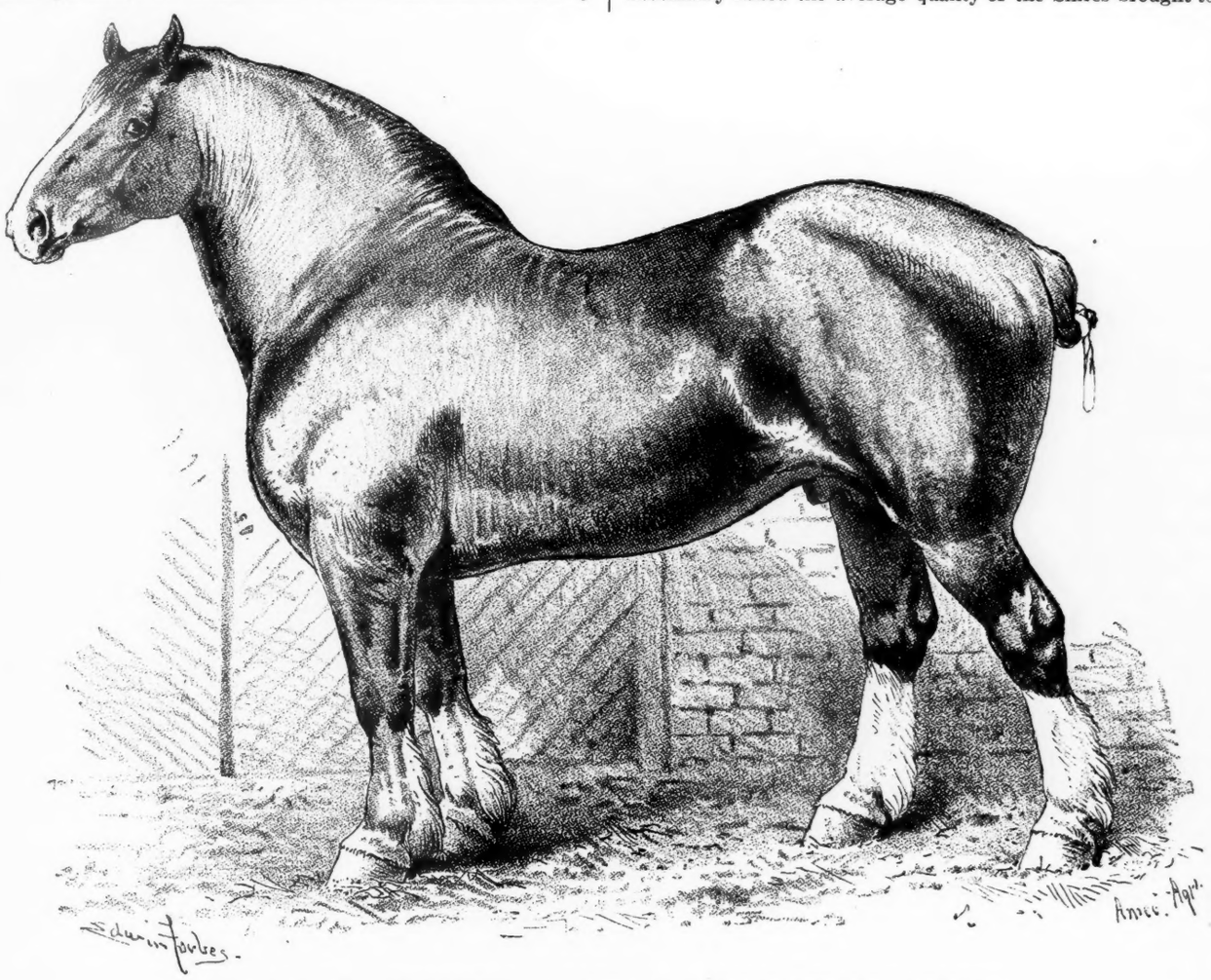
SHIRE HORSES IN AMERICA.

The introduction and rapid increase of improved heavy draft horses in the United States, within the last few years, mark a new era in American horse-breeding. Great Britain and the Continent have alike been laid under contribution for their well-bred draft horses, and enterprising importers and breeders vie with each other in the number and quality brought over. Percherons and other French draft, Clydesdales, Shires, and more recently Suffolks and Belgians, are all so largely represented in the United States that each breed has an American record society, and a stud book duly established to secure pure breeding and otherwise promote success. This work is so recent that only those who have taken special notice of its progress can fully comprehend its present magnitude and future prospects.

Of British breeds, one of the best for heavy work is the Shire. The breed has been known in England for many centuries, in some form, but recent improvements in it have been very great. It is, without question, the "Great Horse" which was used for military purposes when steel-clad warriors won renown not only throughout Europe but to the very gates of Jerusalem. When the general adoption of firearms drove out defensive armor, these heavy horses were no longer wanted as chargers. They were replaced in the army by lighter and more active horses, and the big, ponderous animals were relegated to more peaceful uses. But through all the centuries England has maintained a breed of heavy, powerful horses having many points of the Shire. The recent establishment of the Shire Horse Society, seconded by the efforts of such enlightened and capable men as Mr. Walter Gilbey, Mr. Clement Keevil, Mr. George Lewis, P. Albert Muntz, M. P., Mr. H. R. Hart, and many others, has resulted in bringing up the standard of the English Shire to a point of excellence never dreamed of in the past.

The first importations of Shire horses to the United States were made within the present decade. Their value for heavy draft purposes was readily recognized, and the demand for them grew so rapidly that a British writer, Mr. Sanders Spencer, was moved to remark, in 1888: "The wonderful advance in favor of the Shire among our American cousins is almost phenomenal." This active demand for export to America doubtless gave a decided stimulus to Shire breeding in England. But it appears from unimpeachable home testimony that British breeders and dealers did not hesitate to unload on their "American cousins" some very sorry specimens of the breed. Prof. Wortley Axe remarked in the *Farmers' Magazine* less than two years ago: "Commonplace wretches, with no more than a pedigree to recommend them, and many suffering from the worst descriptions of hereditary ailments besides, have been pressed into the trade by the grace of those who may be said to represent the draft horse interest in America and elsewhere."

But it is believed we have changed all that. American buyers insist upon having sound, good horses, and the British Shire Horse Society has adopted a rigid system of veterinary inspection for all shows held under its auspices. This has led to the registration and exportation of fewer and better Shire stallions, and has necessarily raised the average quality of the Shires brought to the United States. The annual Shire Horse shows at Islington, as well as the Royal and other great agricultural shows, are attended by wide-awake, plucky American importers, ready to pick up the young stallions which win the honors. And, as Mr. Thomas Dykes remarks, "The American dollar, at least, will always have a genuine British welcome, no matter what animated little ructions we may indulge in over tariff and tuberculosis." The effects of this wise and enterprising discrimination are already seen. At the American Horse Show in Chicago, last November, the sweepstake prize for best Shire stallion of any age was easily taken by Galbraith Brothers' two-years-old Cannock Perfection, which had recently been imported with "his blushing honors thick upon him" which he had won in closely-contested British shows. He is for his age the ideal of a Shire horse. At the same show the first prize for three-years-old stallion was awarded to Knowle Light of the West 3208 (9731), imported and exhibited by Burgess Brothers. Nor was it an easy contest in a show-ring of sixteen superb stallions, one of



THE SHIRE STALLION, KNOWLE, LIGHT OF THE WEST.

which, Galbraith Brothers' Goth, so nearly tied the final victor that the decision was long in doubt. Knowle Light of the West 3208 (9731) is a bay, sired by Naughty Tom, dam by Thumper 2d. He won the third prize at the Royal, of England, first at Peterborough, and, being then brought to this country, took first prize at the Illinois State Fair.

There is reason to hope that there will be no future importations of unsound, post-legged, wiry-haired, flat-footed Shire stallions. American farmers have learned what a Shire stallion should be; they have had opportunities for seeing high-class animals, and the unsound and ill-formed ones cannot be expected to receive encouragement. With such Shire horses as we now have in this country, and as the leading importers are on the alert to pick up and bring over, the reputation of the breed is safe in the United States.

MONEY IN SHEEP.

F. K. MORELAND, NEW YORK.

There are few more profitable branches of agriculture even on the high-priced lands of the Eastern and Middle States than sheep-breeding and wool-growing. It is true that wool can be produced more cheaply on the large plains of Australia and the cheap lands of our own Southwestern States than on land worth perhaps from $50 to $100 per acre. But the question of the relative cheapness of production has little to do with the profit of sheep husbandry on the higher priced lands. While sheep can be bred and wool produced at a small cost in Australia, yet as an offset to this advantage they have no home market there sufficient to consume the product, and when farm products are obliged to cross the ocean for a market the profit of production is materially lessened. In other words, we produce in New England and the Middle States wool which sells in our market in competition with wool grown in Australia. While our cost of production is greater our cost of transportation is much less, and on the whole we average more profit; and again, our fat sheep and spring lambs never go begging for a market, and on the whole there are few industries that will pay the farmer more good money for less work than sheep growing. If the farmer who keeps sheep pays a fair amount of attention to his flock and uses average intelligence the profit from his flock can be materially increased. Early lambs of a good mutton breed will always command a good price in the home market. Judicious care at the right time will usually prevent losses among the young lambs. And again, unless the flock is of excellent quality to start with, judicious breeding and selecting the best bred ewes to remain in the flock will be apt to increase the average clip of wool several pounds per head.

The one great drawback, however, and it exists in all thickly settled countries, is the ravages of worthless curs. Two or three dogs in a single night will destroy good sheep and lambs enough to offset the greatest prospective profit for an entire season. If there is any one evil that requires more stringent legislation than another it is the dog nuisance. There is hardly any family so poor as not to be rich enough to own a dog, and the pleasure and comfort of that useless cur they will protect by every means possible, always ready to deny the possibility of their dog doing any injury. One of the best means for protecting the flock against the attacks of dogs is by using a liberal number of sheep bells. If the flock numbers forty or fifty, at least a quarter of them should have each a small bell, and as noisy a one as possible, attached to her neck. If the flock is small a greater portion should possess bells. The reason why bells are a good protection is because sheep-killing dogs are naturally sneaks. They are afraid of detection, and the noise created by a flock of sheep wearing bells will cause them to desist. I have never known a flock of sheep wearing bells to be injured by dogs. We need more stringent laws for the protection of sheep.

A FARMER'S NOTE BOOK.

JOHN C. UMSTED, KANSAS.

Procure a blank book about six by eight inches, well bound and containing not less than three hundred pages. Page the book if it was not done by the maker. Select the list of topics and place them in the front of the book for a "table of contents." Then divide the book up for these topics. In making this division it would be well for the beginner not to take up more than two-thirds of the book at first, for if all the space is occupied he will have no room for additional topics that will suggest themselves as his reading and note making progresses. In dividing up the book give the topics in which you are most interested more space, and minor topics but little. My occupation is small fruit raising and farm gardening. I give an example from my book of my method of spacing: Corn, ten pages; wheat, eight; strawberries, twenty; oats, two; cabbage, six; peas, one; lettuce, one; horseradish, one; blackberries, six; raspberries, eight; hogs, fifteen; poultry, ten; rotation of crops, two; methods of tillage, eight; etc. My list of topics now numbers fifty, and under a few of them the allotted space has been filled and another further over in the book has been given. The method pursued in making notes is to underline with a lead pencil the headings of all articles read that are particularly interesting and which it may be desirable to read again. If any part of it is for the note book I place a cross mark at the heading and also at points along the columns where the matter is to be found, thus obviating the necessity of rereading the entire article to find what is wanted. After the papers are read they are laid away, and when a sufficient number have accumulated to make a volume one and one-half inches thick they are fastened together. Six numbers of the AMERICAN AGRICULTURIST make a convenient sized book. These are laid together evenly and in the order of their dates and covered with strong cloth that extends one-half of an inch beyond the margin of the book. They are laid on a solid block or board and a three-inch wire nail is driven through all the thicknesses and into the board just enough to hold it in four places evenly spaced about one-half of an inch from the back edge. One of the end nails is then withdrawn and a stout cord is run through and tied across the back. The other end is similarly fastened, then the remaining nails are withdrawn and the tying completed. Most of the notes are made as well as much of the reading and marking is done during the winter season at times when there is no work crowding. In making notes special care is taken not to repeat anything that is already written as far as can be helped, and only to write down those things that are so striking that it would be desirable to try what is recommended; also to make the notes as short as possible and yet have the matter sufficiently clear.

The following items from a page in my note book illustrate my method, but is only a small part of the notes I have on the subject:

POTATOES.

1 Sandy loam, best soil, sod ground preferred.
2 Ground broken up deep in the fall.
3 Use medium size smooth tubers, cut to two or three eyes.
4 Cut and dust with plaster, plant as soon as cut.
1 Plant sets ten inches apart.
2 Select the most prolific hills of smooth, good sized tubers at digging time for seed.
3 Dig when dry, store in a cool, dark place in slatted bins.
4 Good plan to thin hills to three strongest sprouts.
1 Removing the blossoms increases the yield.
1 Remedy for rot—hilling to cover the tubers more than four inches.

Notes from AMERICAN AGRICULTURIST prize contest.

1 Ground usually level.
2 Naturally dry.
3 All classes of soil.
4 Mostly cut to two eyes, rows three feet, sets nine to twelve inches apart in the row.
5 Stable manure freshly applied, bad.
6 Sets with strong sprouts started best.
7 The Trench system a good one.

The numbers indicate how many items were taken from one article. A book made in this way is not an ordinary one man, one idea book, but when full you have the condensed experience of practical men all over the country on the subjects in which you are most interested.

Wild Grasses of the Plains.—One of the leading problems for the Western land owners is that of forage plants for the plains. Over that vast grazing region the native grasses are fast losing their hold, and it will be necessary to fill their place with those well adapted to the new conditions. Dr. Bessey, who has made an extended study of the subject, is convinced that no one kind will suffice; in fact, several species are required, as grasses thrive well together, and above all they must be perennial. In those arid regions it goes without saying that they must be well able to bear the trying conditions of heat and drought that frequently obtain. Grasses introduced from the East, in ordinary localities, have done only fairly well, and it seems quite evident that the subjects that are to prove best must be from the best of the native species, but greatly improved under the care and culture that man can give them. Thus the kinds of wild rye (*Elymus*), the wild wheat grass (*Agropyrum glaucum*), and several other species may possess possibilities yet not dreamed of. With the experiment stations of the States of the plains nearly all working upon this very important problem, we may hope soon to record important steps of progress.

TROUBLESOME PRAIRIE WEEDS.

PROF. L. H. PAMMELL, IOWA.

The genus *Solanum*, to which most of our weedy nightshades belong, illustrates some of the features of the weedy plants of the West and Southwest. The Spiny nightshade or Buffalo bur (*Solanum rostratum*) is a native of the Western and Southwestern

FIG. 1. THE SPINY NIGHTSHADE.

plains. Figure 1 shows the general character of the plant. The very spiny branches and leaves and bur-like berries are quite characteristic. The calyx in this species has become a protective organ. It so closely invests the berry that it appears as a part of it. The petals are yellow. It is an annual, growing from one to two feet high, and is bushy in its habit. Originally this species was found on the Western plains from Nebraska to Texas, but since the prairies have been under cultivation it has gradually extended eastward. It now occurs in Illinois, Central New York, Tennessee, Massachusetts, Canada, Rhode Island, New Jersey, Wisconsin, Iowa and Missouri. In parts of Western and Southwestern Missouri it is a most pernicious weed. In Texas it is the most striking weed along roadsides and in fields. It is so aggressive as to crowd out all other plants, especially in the streets of villages and cities. Cattle carefully avoid it. Is it anything to be wondered at that this plant should spread so rapidly since it is allowed not only to mature its seeds, but also to be afterward scattered over wide areas a tumble-weed. The Carolina nightshade or Horse nettle (*Solanum Carolinense*) is quite different in its habit. Originally not a prairie plant, it is gradually encroaching and extending westward and northward. It occurs from Connecticut south to Florida and west to Texas. In the South it has long been known as a troublesome weed in cultivated grounds. In Illinois and Missouri it is also becoming more common. For when once established it becomes so persistent in the loose prairie soil that it is difficult to exterminate. The rootstocks are so well developed and penetrate the soil so deeply that it withstands all drought, and a large number of young plants are produced when a single rootstock is cut. The leaves are not so prickly as in the Spiny nightshade. These prickles, no doubt, suggested the common name "Horse nettle." The flowers are of a pale blue color, sometimes white—and look much like those of a potato. It is a perennial.

FIG. 2. THREE-FLOWERED NIGHTSHADE.

The Three-flowered nightshade or Wild potato (*S. triflorum*), shown in Fig. 2, is becoming troublesome. Five years ago it was comparatively rare in Northern Montana, although a native along the slopes of the Rocky mountains. The plant grows better in cultivated ground, and it is a fact worth recording that it grows best of all in situations particularly suited to the development of the common potato (*Solanum tuberosum*). In its final condition the plant spreads on the ground in mats three feet or more across, the branches usually rooting all along the parts touching the earth and bearing many pale blue to purplish flowers. It is a most pernicious weed, harboring potato bugs, which live upon the leaves. In 1887 and 1888 an enormous crop of potato beetle larvæ were produced in Montana chiefly upon this weed, from which they migrated to all convenient potato fields. This weed is a regular swarming place for

YOUNG RAMIE PLANTS.

Colorado potato beetles, which lay eggs by the thousands on the leaves everywhere. The plant is an annual and produces vast numbers of berries filled with seeds, by which it perpetuates and spreads rapidly in cultivated soil. Northwestern farmers should do all in their power to keep it in subjection.

CULTIVATION OF THE RAMIE PLANT.

W. H. W. CAMPBELL, CALIFORNIA.

The French Government has been liberal in expenditure with a view to the cultivation of ramie at home and in the colonies. It is plain, however, that like the orange the ramie loves heat and water, judiciously applied, and that its true home is in sunny lands. Impenetrable masses of it may be found in the north of Mexico and in Texas, where attempts at culture have been abandoned. A French expert doubts its success in the south of France, or even in Algeria, but speaks with enthusiasm of samples from America. There is no doubt that on the so-called desert lands of our own great Southwest the ramie would grow prodigiously with irrigation, even reaching the maximum of six annual crops. It is, then, a question of importance for the people of the United States. Prof. Hilgard, of the California experiment station, is quoted as saying that "ramie will

grow in our climate to perfection, not only on strong soil, but also on alkali lands which are practically worthless for other purposes; from two to three crops a year can be cut, and an uninterrupted prolific growth will be the result."

The preferable soil for ramie culture is a light loam. It may be a little sandy, but not greatly so; and not salty as in Egypt and Peru. It is important that the subsoil should be porous, that the irrigating fluid may penetrate deeply. A layer of clay interruptiug the free passage of water, for example, would in time ruin the plantation. The propagation of ramie is possible by all known means—seed, layering, plants, etc. The most feasible is, doubtless, that by root division, as one root of a year's growth will furnish twenty or more cuttings for reproduction. In Algeria they cultivate in frames with root layers. It is asserted that one acre of roots will yield stock enough for ten acres the following year. Close planting is advocated—rows about two feet apart and plants about twelve inches from each other. They may be set in quincunx. A row of young plants is seen in our engraving. If the plantation becomes too dense, it should be thinned and the dead plants carefully removed. The planting should be preceded by deep plowing. Other authorities advocate rows three feet apart, with use of the cultivator against weeds till the spaces are thoroughly filled up. The question of manuring may be left to experience. In time it will be needed, as in all other crops. Common barnyard manure is good. The duration of the plantation cannot be stated precisely. Experience in our new regions will show when the time of renewal is appropriate. In the culture as in the manufacture of the ramie plant, nearly all is yet to be learned. As encouragement for planters in California and the arid Southwest, we are told of one root eighteen months old, at San Lorenzo Creek, which had produced 316 stalks of the average height of sixteen feet. On the calculation of 5,000 roots to the acre, it is figured taking the yield of crude fiber at fifteen per cent only, that the gross income per acre on two crops per year, would be, at five cents per pound, $281.25; on three crops, $421.87. Even smaller figures would pay, and there is the possibility of a greater number of crops under favorable conditions. Evidently the outcome of the various ramie machines and processes has a lively interest for future settlers of our vast Southwest.

FIG. 1. OLD STYLE NECK YOKE.

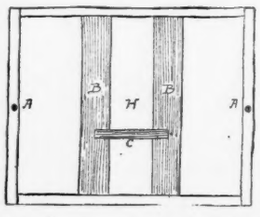


FIG. 2. FRAME NECK YOKE.

THREE KINDS OF NECK YOKES.

Any one who has to carry water for the house, milk, pig food, or other liquid any distance, will find one of the instruments in the illustrations of great service. With them a man can carry two three-gallon pails with ease, and in passing through a door the pail has not to be set down to open the door; the hands being only used to steady the pails and help the shoulders. Fig. 1 shows a neck yoke of the old pattern which has been used for ages. It consists of a stick of light soft wood fitted to the shoulders. Fig. 2 is made of a wooden frame A, across which are fastened the leather straps, BB, a short piece of webbing, C, holds the straps from spreading and slipping over the shoulders when in use. The buckets or other burdens are suspended from hooks at the end of ropes or straps fastened to the wooden frame at the points indicated by the black dots. Fig. 3 shows an improved form, embracing the advantages of both the others. Two sticks, bent to the proper curve, and riveted together at the ends, and straps fastened to them as shown in the engraving, which is clear enough without detailed description.

FIG. 3. IMPROVED NECK YOKE.

CONVENIENT BOTTOM PLANK FOR WAGONS.

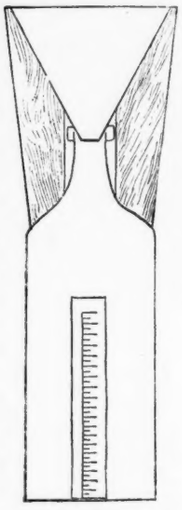
In many sections of country, farmers and teamsters who haul sand, earth, and stone employ a strong and cleated bottom board, made in one heavy piece. Such a large and strong bottom board is objectionable in several respects. It is heavy and inconvenient to handle when it is to be put on or off a wagon. More than this, much more labor will be required to remove a load than if the bottom consists of six or more single pieces of plank, not held together by cleats. The accompanying illustration represents a single piece of a wagon bottom. These planks should be made of strong and straight-grained lumber, two inches thick by five or six inches wide. A handle should be made at each end (as shown in the illustration), both on the same side of the plank. The usual practice is to make a handle at the middle of the plank. When the handles are at the middle the teamster cannot unload any loose material so readily as when the handles are at one side ot the plank. Every intelligent person can readily perceive the advantage of making the handles both at one edge of the planks. Small cleats can be nailed to each plank on the underside to keep them from moving forward

BOTTOM PLANK FOR WAGON.

and backward when the wagon is moving up or down a hill. The handles should be made only four or five inches long. If made long they will be liable to split off when the planks are thrown down.

AN AUSTRALIAN RAIN-GAUGE.

The accompanying engraving shows a sectional view of a rain-gauge, of which the sketch and description were furnished by Mr. D. G. Atkinson, of Queensland, Australia. The body of the instrument is made of a large, clear-glass bottle. A funnel of zinc is made with a diameter of exactly 4.697 inches at the open top. A piece of wood five inches in diameter and six inches long is bored and reamed out into a form the section of which is shown in the engraving, the upper part to contain the funnel and the lower to fit loosely on the neck and shoulder of the bottle. The funnel is firmly fastened into the block and the upper part of the bottle fitted into the block by plaster of Paris. To gauge the bottle pour in an exact fluid ounce of water and with a small brush mark the level of the water surface on the outside of the bottle with paint. Repeat this, making a mark for every fluid ounce of water. To read the rain-gauge reckon every liquid ounce as one-tenth of an inch of rainfall. Zinc is the best metal to make the funnel, as it does not easily corrode. The funnel must be fast to the wood, otherwise the rain would rebound off. The weight of the wood prevents the wind blowing the funnel away. The gauge should be set in some open situation, clear of all trees, buildings, etc., and about five feet from the ground. The contents of the bottle should be equal to the greatest rainfall on record in the district.



INEXPENSIVE RAIN-GAUGE.

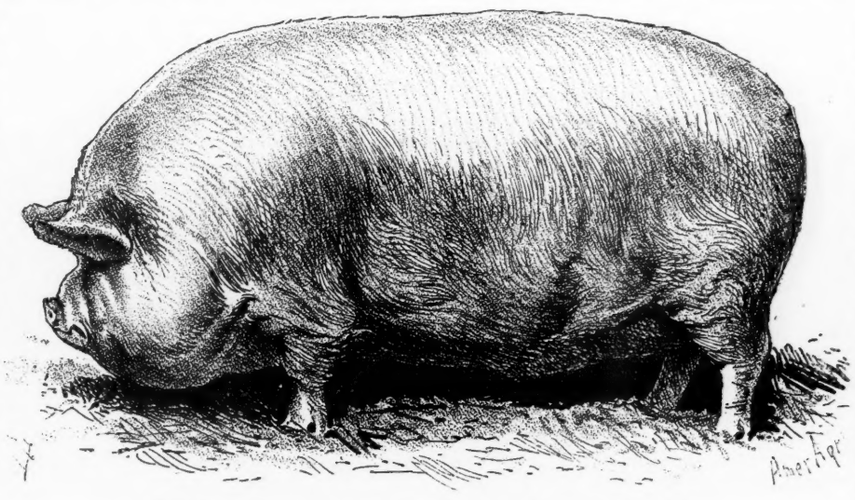
1 inch rainfall.....22,622.5 gallons per acre,
1 inch rainfall.....100.99 tons per acre.

In Europe about 21 per cent of the rainfall percolates through the soil, the other 79 per cent being lost by evaporation and by exhalations from plants.

The New South.—Northern farmers were once apt to pity their Southern brethren for their neglect of good work, diversity of crops and other needs of good farming. But all this has changed materially. There are some of the finest, pure-bred herds of cattle in the South; fodder crops are being grown; dairying is rapidly developing; the average product of crops is doubling and trebling; Southern farmers are out of debt to a large extent, and wealth is accumulating in the farmers' hands. The New South is seen not only in the factories, the mines and the workshops, but in the blooming cotton fields; the green clover meadows, the pure-bred cows, silos, and the greatly increased products of the fields.

SMALL YORKSHIRE SWINE.

The breed of swine known in America as Small Yorkshire is of English origin. Until within very recent years there was much confusion and uncertainty regarding the names of English breeds of swine. The great improvement in swine-breeding which began in England about one hundred years ago was zealously prosecuted by the introduction of Chinese and other breeds, as well as by careful selection and crossing. The result was an almost infinite variety of breeds—black, white, red, and variously spotted, but all of them greatly superior to the coarse, flat-sided, long-legged, large-boned grunters of former centuries. Youatt and Martin, writing in 1847, describe six breeds of white swine, and twenty-three breeds of other colors. Still later other white breeds came in. At length the National Pig Breeders' Association was organized in Great Britain and it soon placed the matter of nomenclature upon an intelligent basis. The white breeds were reduced to three, known respectively as Large Whites, Middle Whites, and Small Whites. The American Chester Whites, Cheshires, and Victorias all have points in common with the Large Whites of England; our Suffolks are similar to the Middle Whites; and the Small Yorkshire is identical with the Small White of the British Association. The last-named breed possesses qualities which eminently fit it for filling the position of what may perhaps be called the family pig. With its chunky frame and pug nose it is not built for "rustling." Indeed, if reduced to the alternative of "root hog or die," one of them could hardly be expected to long maintain the struggle for existence. But with comfortable quarters and the smallest reasonable amount of suitable food, it leads a life of serene and luxurious content, stretching out and waxing fat from day to day, until the grand transformation scene reduces it to delicate, thin-skinned rashers, savory hams, and succulent spareribs. The Small Yorkshire is peculiarly the pig for the village and suburban resident rather than for the man of broad acres and plethoric corn-cribs. The present demands of the pork-market are for plenty of muscle, for meat nicely marbled with "streaks of fat and streaks of lean." The sophisticated "lard compounds" of stearine, cotton-seed oil and other grease, with which the markets are flooded, have greatly reduced the price of really pure lard. People who raise and feed swine for the market, therefore, prefer other breeds than those which "run to fat." But the fortunate man whose village or suburban premises are large enough to afford him a garden and a place to keep a family cow and one or two pigs is best suited with those of a small and quiet breed, which will render a full account of all the food supplied to them. If he can give his pig ever so limited a run on grass or clover during the early months, so much the better. This, with the refuse of the garden, the scraps from the house and, if need be, a moderate addition of middlings and oil-meal, will carry the pig through the summer. Then it is shut up in a clean pen and, with a few weeks of judicious finishing on corn-meal, will turn out a porker which would have delighted the soul of Elia.



THE PRIZE YORKSHIRE BOAR TOM.

The Small Yorkshires have become permanently established in the United States, and are bred here with great care and purity. The American Small Yorkshire Club, which is maintained to preserve the purity and promote the interests of the breed, is composed of intelligent and enterprising men. Our illustration is a very life-like portrait of the Yorkshire boar, Tom, which took the first premium for his class in the Chicago fat-stock show last November. The animal was owned and exhibited by Mr. A. P. Chapman, of Sugar Grove, Illinois. It is a good, typical specimen of the breed—fine in bone, small in head, broad of back, with a great proportion of meat in the best places, and the lightest amount of offal.

ARTIFICIAL REFRIGERATION.

N. R. BRIGGS, NEW YORK.

The first authentic employment of refrigeration as a method for preserving perishable substances and retarding their decay was attempted by a Presbyterian minister, the Rev. Benjamin Nice, of Greensburg, Ind. In 1857 he built a refrigerator measuring twelve by thirty feet inside, with walls four feet thick. The shells were built of wood and filled in with chaff and corn cobs. The object was to keep fruit—especially such as pears and peaches—longer than could be done in cellars. At that time the preservation of meats by such means was not thought of.

In New Orleans, about 1868, a company was organized to build ice-making machinery for the supply of the city's demand. The principles of "Carre" were used, with the addition of the "Reese" improvement. This effort, after vicissitudes which seem to be necessary to a new undertaking, two years having elapsed, was finally crowned with success, and has many times over paid its promoters back the money originally invested in the project.

The system of refrigeration in vogue to-day by mechanical means is accomplished by the use of ammonia being compressed through pipes, by large pumps, until it passes from a gas and becomes liquid anhydrous ammonia. This fluid is then ready to expand in chambers where a low temperature is maintained, it being in proportion to the pressure upon which the gas is vaporized. This is usually accomplished in vessels having a pressure of two atmospheres, which produces a temperature of 26° below zero. When this gas is liberated in a vacuum of twenty-four inches, that is, a vacuum that would lift a mercury column twenty-four inches in height, it produces a temperature of 112° below zero. In the construction of ice machinery for general refrigeration, the receptacles for the vaporization of the gas, as mentioned, are as a rule iron pipes made up in coils, either of one continuous length or fittings made of steel with soldered joints, or with the best cast iron, with screw joints backed with gum washers. The pipe circuit is a continuous one after the gas is vaporized and its heat taken up. It is then taken back to the machine and recompressed into liquid. At no point in the circuit is there an open pipe, or opportunity given for the gas to escape, the process being continuous, using the gas over and over again. The coils of pipe are placed in a tank around which brine is circulated, being cooled by coming in contact with the pipes holding the ammonia gas; it is then sent circulating through the rooms, tanks, or wherever the service may be required, taking up the heat in its passage from the places requiring to be cooled, and transmitting the heat through the ammonia gas back to the water used in cooling the gas in its process of condensation. The brine is made from either ordinary salt or from chloride of calcium, the latter being a by-product of salt manufactured. The scale for measuring the density of brine is divided in parts from 0 to 100. Ocean water represents on this scale twelve per cent. Water at 60° F. will take up the greatest quantity of salt, and as it varies from that temperature, either heated or cold, the salt will deposit in the bottom of the receptacle. Brine at 6° temperature, and made from salt, will stand a percentage of eighty-five per cent. But in no way does this brine come in contact with the ammonia gas referred to.

To give some idea of the value of machinery in active use in the different cities of the Union, I give the following from a table prepared for an insurance company in 1890: New York city, $1,751,000; Brooklyn, $785,000; Newark, N. J., $360,000; Philadelphia, $624,000; Boston, $215,000; St. Louis, $658,000; Milwaukee, $456,000; Buffalo, $152,000; Rochester, $179,000; Staten Island, N. Y., $234,000; Cincinnati, $398,000; Kansas City, $440,000; Chicago,

$785,000; Cleveland, $130,000. It may be safely estimated that there is within the United States at the present time at least $18,000,000 invested in refrigerating and ice-making machinery. Its adaptation is nearly as varied as that of coal for heating purposes. It is unnecessary to speak of its universal use in breweries, beef and pork packing houses, and abattoirs throughout the country. The Trunk lines of railroads are also appreciating the great benefit of these systems, and are now erecting at their terminal points large refrigerator buildings. In Philadelphia, the Pennsylvania, and Baltimore & Ohio railroad companies, are now completing their new buildings and equipping them with large plants. The N. Y. Central & Hudson River R. R. Co. were the pioneers in this undertaking, and have for a number of years maintained at their St. John's Park depot, New York, large refrigerating or cold-storage rooms. The use of small machinery for domestic purposes is also becoming every year more general, and such can be purchased to-day with a capacity from one ton upward.

When refrigeration was first attempted it was thought that for the preservation of fruit a temperature in the vicinity of 40° was sufficient, but with the experiences of to-day it is found that it is better to keep the temperature to about one or two degrees above freezing. The preservation of furs by keeping them cold would strike those unfamiliar with the business as being unnecessary, and yet nearly all large fur dealers have their cold-storage rooms with a temperature at or below the freezing point, as they find it very unhealthy for the existence of moths and other insects. The keeping of nuts—especially English walnuts, which soon become rancid—under a temperature of 30°, keeps them for two or three years. The conditions of obtaining an absolutely dry atmosphere can be had only by intense refrigeration. Where such an atmosphere is desired, the result is easily and quickly obtained by this process, although in some instances it becomes a serious objection. The tendency of meat in an extremely low temperature is to shrink its weight by the absorption of the water from the meat and its congealing around the pipes conveying the brine.

The writer, desirous of learning whether the manufacture of small and portable plants for hotels, plantations, and large dairy farms was practicable at low prices was informed by an expert in the business that it was beyond doubt. In fact there can be no doubt that compact and portable ice machines and refrigerators combined, with a capacity of from two to three hundred pounds of solid ice per day of ten hours, and requiring but one and a half horse power to run it, and a trifling expense for freezing material, will be generally introduced. Extensive practical experiments have also proved the probability of constructing another small plant, which is to be operated without the use of steam power, and which will produce three tons of ice per day, at a cost of less than two dollars.

AMERICAN HAVANA TOBACCO.

FRANK PHILLIPS, FLORIDA.

However carefully tobacco may have been grown, if it is not properly housed and cured the best crop may be ruined. The old style of gathering the crop was to cut it; that is, to split the stalk and cut the plants off close to the ground, put them astride a tobacco stick and hang them on scaffolds to yellow, after which they were taken to the barn and cured by fires. By this means, although the plant was said to be ripe, the most forward leaves would be overripe and begin to spot, while others would be partly or wholly green, so there were few in exactly the right stage of ripeness. In Florida, however, new methods are being introduced, and, while the simple act of housing is rendered more tedious, each leaf is taken from the stalk as it reaches ripeness, and the perfection of its best qualities is assured.

When the ripening season arrives the fields are closely watched, and as the leaves become thoroughly ripe—which an experienced eye detects at a glance—they are removed from the stalk and placed in trays or broad-bottomed baskets, and taken to the curing house. There they are sorted and sized, strung, and hung up in rows and tiers, the steam and hot water are turned into pipes and evaporating pans, and the proper degrees of heat and moisture are at once secured to produce the desired fermentation and cure the tobacco in all its fragrant excellence. The tobacco, after being hung in the curing house, is not disturbed or handled until it is thoroughly cured. It is then tied in bundles and is ready for market. By this means the tedious process of gathering the leaves in the field is more than compensated by doing away with the many handlings in stripping, bulking down, hanging up to case, etc., of the old methods, and tobacco is thoroughly cured in thirty days, whereas the old style consumed several months. The chief advantages of the new mode are that the most desirable qualities of tobacco are preserved in the highest degree, there is no need for any leaf to be too ripe or too green, nor for any to be bruised, weather-beaten, house-burned, or "funked"; in fact, the flavor, color, texture, weight, and richness of tobacco are fully developed, and added to and improved in a manner heretofore unattainable.

The excellence of Florida Havana tobacco and the high favor with which it has been received by manufacturers, dealers, and the smoking public, together with the high prices which well cured and properly handled crops command, will soon crowd every available field, and has already greatly advanced the prices of favorably located lands. It can hardly be doubted that the demand will always exceed the supply, for certain climatic and atmospheric conditions are essential to the production of the peculiar aroma of this class of tobacco. These may exist to some extent in other sections, but in no other State in the Union has cigar tobacco been grown to such perfection as in Florida. It is true Cuban tobacco has been grown in Kentucky, Tennessee, Virginia, and North Carolina, but it always degenerates in a short time. In Kentucky, to the writer's personal knowledge, obtained after repeated trials, Cuba tobacco loses all semblance of its flavor in the second or third crop, and cannot be cultivated with any satisfaction or profit. Florida Havana, on the other hand, is equal in every respect to the best Cuban grown, provided it is handled and cured properly.

The cost of cultivating Florida Havana tobacco is less than fifteen cents per pound, and the curing process need cost but little more, yet it rarely sells for less than thirty cents, and often for seventy-five cents to one dollar per pound, and the quality and prices have advanced more and more each year as the mode of handling and curing has improved. At the same time the acreage has increased fully a hundred fold within the last five years; but even this has been outstripped by the demand, so rapidly has Florida tobacco grown in favor.

THE VALUE OF ORCHARD GRASS.

PROF. W. F. MASSEY, NORTH CAROLINA EXP. STATION.

Several years ago, orchard grass was my pet aversion among grasses. A few years' experience in the steep red hills of Piedmont, Virginia, where I was compelled to use it largely as the readiest means for getting grass on thin, steep hillsides, caused me to modify my opinion of this grass very considerably. I am now satisfied that there is no better hay, particularly for horses, than orchard grass hay, when cut at the proper time. This proper time is as soon as the heads appear and before the blossoms are open. No grass so rapidly deteriorates and becomes worthless as orchard grass, and this is the chief impediment in its cultivation for hay. The proper time for cutting it comes so early that we seldom have good haying weather when it is ready. It is not, therefore, a grass adapted to extensive culture for hay making, for no farmer should have more of it than he can secure within a few days. But the chief value of orchard grass on large farms, it seems to me, is its capacity to produce a strong growth on thinner land than timothy will thrive upon, its large and abundant roots, which make it useful in holding the soil on steep hillsides, and its early and late pasture value. I found it of great value in seeding permanent pastures when mixed with blue grass and others of a slower and more delicate growth when young. The habit of orchard grass in getting into tussocks is an advantage here, for between these stout tussocks the blue grass is protected until strong enough to hold its own, and finally to overcome the orchard grass. In Maryland, Virginia, and southward, if the orchard grass is mowed but once in spring, and then allowed to grow unpastured during summer and autumn, the rank tussocks will hide and shelter an abundant calf pasture all winter, and keep them in thriving condition in all weather that any animal should be out. In short, I now consider orchard grass as one of the most valuable of grasses, particularly for the South, but I sincerely pity the man who has a hundred acres of it to mow in our usual spring weather.

Supplementing the Pastures.—When the pasturing season begins it should be remembered that by and by the grass will fail at the very time when the cows need full feeding. To provide for this is a present necessity by sowing an acre or two of millet or drilling in early sweet corn, either of which will mature in sixty days. And as soon as a seeding is made it is time to look about for an opportunity of making another.

AMONG THE WALNUT GROVES.

CHARLES H. SHINN, CALIFORNIA.

The extent to which walnut culture has already become established in California can hardly be realized by Eastern farmers. The native black walnut of the Pacific Coast thrives everywhere, and is a common shade tree, preferred in most cases to the Eastern black walnut. This Californian wild walnut is now used by many growers as the best available stock on which to graft the choicer named varieties of the English walnut (*Juglans regis*). Nearly all the California growers who have tried it think that the fruitfulness of the tree is increased, and some claim that it is also hardier. The Japanese walnut (*Juglans Sieboldii*) is grown to some extent, and thrives in Shasta and Trinity. The Persian walnut, which may be called the original stock of the English species, is largely planted. Seedlings of merit, grown by various orchardists, are beginning to appear in market. One of the best of these is "Ford's Soft Shell," from Santa Barbara. These are so large that they sometimes run only eighteen to the pound. The best French varieties, such as Præparturiens, Mayette, Grenoble, and others from the famous walnut districts, are being introduced. This walnut region of France extends from the ocean to the Alps and Jura, and from the Loire to the shoulders of the Pyrenees. Marseilles has been a great walnut market for hundreds of years. The single department of Dordogne exports nuts to the value of one million dollars annually. Half of the oil used in France is made from walnuts, and eighteen pounds are procured from every hundred pounds of nuts. By planting the best kinds of walnuts on good soil in California, the grower can usually depend upon some return the fourth year from the seed; at six years of age the yield is fifty pounds per tree and at eight years one hundred and fifty pounds. An eight-years-old orchard of the best soft shell walnuts will produce fruit worth $270 per acre. The expenses are small, as the nuts are only gathered and sacked, and hardly any pruning is required. Profits of four or even five hundred dollars an acre are reported, but half as much is a large interest on two thousand dollars an acre. Walnut trees are so large that they are planted forty feet apart, or twenty-seven trees to the acre, and green crops or peach trees are planted between until the walnuts need all the ground.

Ventura, Santa Barbara, and Los Angeles long led in walnut culture, but it is now thought that four-fifths of the State is adapted to walnut groves, and a remarkable increase of orchards can now be noted in Alameda, Santa Clara, Sonoma, and other northern counties. Seedlings of the ordinary sorts are much longer in reaching a bearing period than the best grafted kinds are; often it will take ten or twelve years to have a seedling grove become profitable, and this fact has deterred many from planting. But, with more knowledge on the subject, the walnut may be reckoned as one of the coming industries of California. It has been suggested that walnut trees should be used as street and highway trees in California, taking the place, wherever practicable, of the Eucalyptus, which is of little value. The walnut is a good shade tree, extremely healthy, and free from insects; its wood is useful, and whatever crop can be grown would add that much to the food supply. In the rich valleys thousands of full bearing and large walnut trees could be thus established by the roadsides; and even if children, squirrels, domestic animals, and wandering tramps managed to obtain the largest part of the crop there would often be something left for the land owner. Miles of unplanted roadsides are a neglected source of revenue, not only in California but in other parts of the United States. Where the English walnut will not grow, the American chestnut, hickory, pecan, and other nut-bearing trees could be used. A single company is now planting 30,000 trees, another is breaking a thousand acres to set in walnuts, and many smaller groves of from twenty to fifty acres will be planted this season. The acreage already planted is large, and begins to furnish an appreciable part of the demand; but shippers say that there is no danger of overloading the market. Not a gallon of walnut oil has yet been made. Even San Francisco is not yet wholly supplied with California-grown walnuts. It is a very large field that the experiments of the past fifteen years has opened for industry and capital. Fig. 1 shows a bearing branch of walnut, and in Fig. 2 are seen some thrifty walnut trees. The walnut tree, like many other nut and timber-yielding trees, has been too much neglected in America. Many of the valuable furniture and cabinet woods, as well as the immense quantity of nuts which we now annually import, might be profitably grown within our own boundaries. Let orchardists take hold of this matter earnestly and we shall soon be self-supplying.

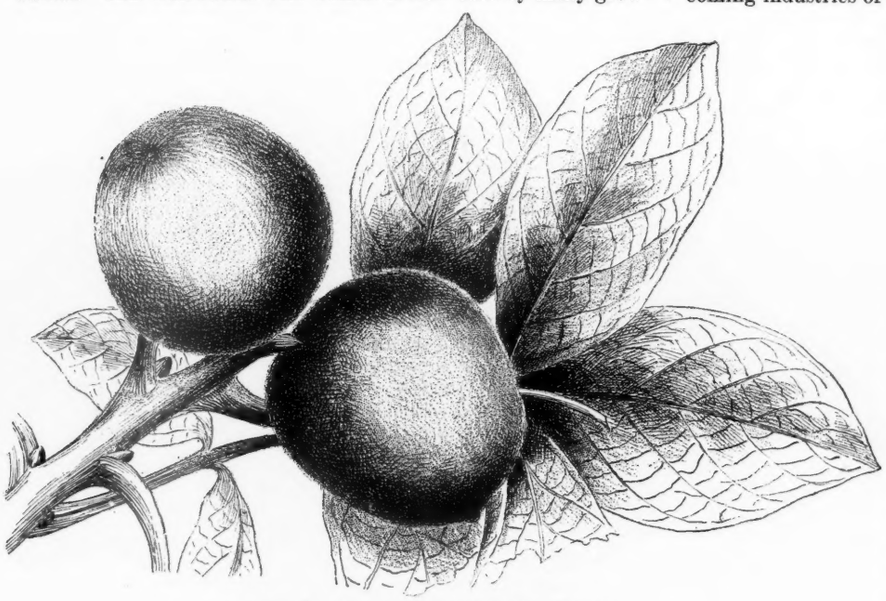


FIG. 1. BEARING BRANCH OF WALNUT.

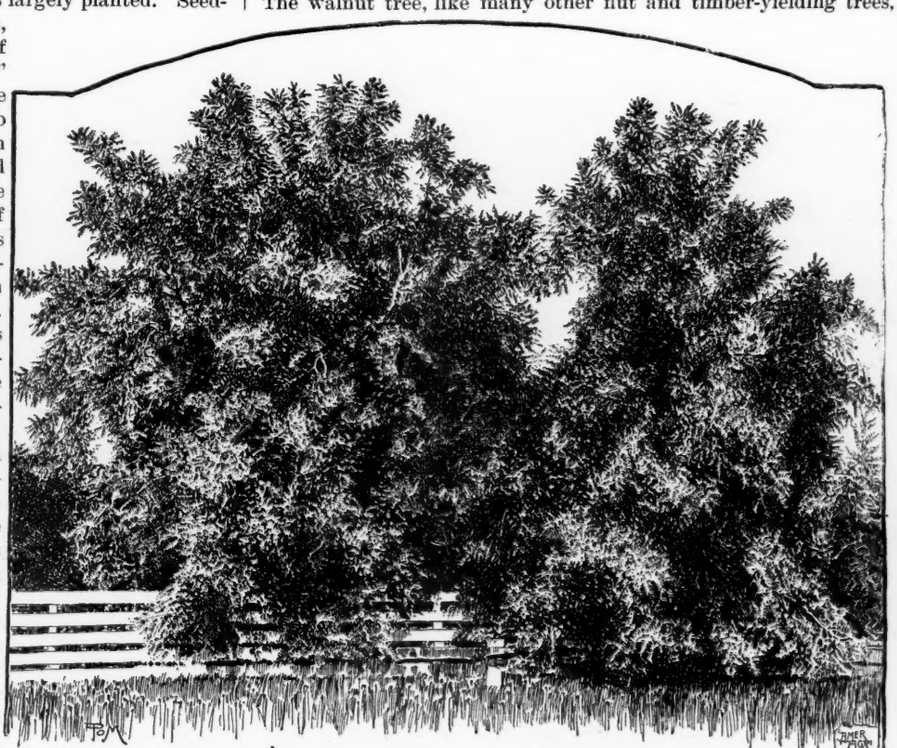


FIG. 2. WALNUT TREES IN CALIFORNIA.

NITRATE OF SODA versus SULPHATE OF AMMONIA.

J. J. WILLIS, SUPERINTENDENT, SIR J. B. LAWES'S EXPERIMENTS, ROTHAMSTED, ENGLAND.

The importance of some nitrogenous artificial manure for application to our spring-sown crops, or as a top-dressing to our autumn-sown wheat is now pretty generally recognized among all intelligent agriculturists. The main question seems rather to be—"What shall we apply?"

No ordinary cultivated plant can thrive without a sufficient available supply of each of a number of substances needed for its food and nourishment, and our ordinary commercial fertilizers owe their chief value to phosphoric acid, potash, and nitrogen. The rule, therefore, in purchasing artificial manures should be to get those which supply in the best forms, and at the lowest cost, the plant-food that the crops need, and that the soils we have to cultivate fail to furnish.

The commercial value of nitrate of soda, and of sulphate ammonia is based entirely upon the amount of nitrogen they contain, notwithstanding that the action of the two substances in the soil is very different. Both fertilizers supply the plant with nitric acid, and in consequence of the lower price of these articles during recent years they have been more than ever used for spring top-dressing, both in market gardens and on the farm, for which purposes they are admirably suited.

The best samples of sulphate ammonia contain from twenty-four to twenty-five per cent of ammonia. The valuable principle contained in sulphate ammonia is more readily fixed or retained in most soils than is the case with nitrate of soda—thus yielding to the growing plant a slower and more even supply of food than does the quickly-acting nitrate. For this reason sulphate ammonia is frequently recommended instead of nitrate of soda for autumn, or very early spring use. But it must be borne in mind that with sulphate of ammonia the formation of nitrates is attended with the production of sulphate of lime, and therefore, with a considerable removal of the soluble sulphates from the soil, so that a continuous application of sulphate ammonia to most soils is attended with greater exhaustion of fertility than is the case when nitrate of soda is used. Nitrate of soda of ninety-five per cent purity contains fifteen and three-quarters per cent of nitrogen, which is equal to nineteen per cent ammonia.

It has frequently been laid down by agricultural chemists that on account of the very ready solubility of nitrate of soda it should not be applied to the soil till the time of year when the rootlets of the crop are developed and ready to appropriate it. Latterly, however, there has been an increasing disposition to use it, either alone or in mixture with superphosphate or other manures, for spring crops—sowing the manure broadcast after the drill, and harrowing in with the seed. In many cases this plan has answered well, especially in a dry spring and on limestone soils. But on open permeable sandy soils, through which the water passes readily, there is much danger of the very soluble nitrate being washed into the drains before the rootlets are sufficiently advanced to take it. This danger is of course great if much rain falls in the two or three weeks just after sowing. It is therefore recommended that small quantities of this manure be used at two sowings—say one hundred pounds per acre each time—rather than one sowing of two hundred pounds.

When nitrate of soda is employed as a fertilizer, an alkali is liberated from the soil which has a decomposing action upon the minerals of the land. It is accordingly most important to remember that if the nitric acid in the soil is to be taken up to the greatest advantage by the growing crop, it is particularly necessary that the land be not deficient in any of the mineral or phosphatic constituents which the plant requires. These may be supplied by ordinary barnyard manure or superphosphate.

In order to arrive at some conclusion as to the relative value of those nitrogenous fertilizers, we cannot do better than refer to the invaluable experiments of Sir J. B. Lawes, at Rothamsted, England, and of those of the Royal Agricultural Society of England, which are conducted at Woburn, Bedfordshire, giving for comparison the results obtained without manure, with mineral manure alone, with nitrate of soda and ammonia salts each alone, and these latter in combination with minerals. The soil at Rothamsted is a moderately heavy loam, while that at Woburn is light and sandy.

The Rothamsted experiments with wheat have been in progress since the year 1844, those with barley have been in progress since the year 1852; while those at Woburn with both wheat and barley commenced in 1877.

Experiments with Wheat, grown year after year on the same land:

Manures per Acre.	*Rothamsted Average Produce*	*Woburn Average Produce*	*Increase by Manure*	
			Rothamsted	*Woburn*
DRESSED GRAIN PER ACRE—BUSHELS.				
Without manure	13½	17¼	.....	.....
Mineral manure alone	15¾	18	2⅜	0¾
Ammonia salts alone 400 pounds	20¾	26¼	7⅜	9
Nitrate soda alone, 550 pounds	23½	24½	10⅛	7¼
Mineral manure and ammonia salts, 400 pounds	32⅜	39⅝	19⅞	21⅜
Mineral manure and nitrate soda, 550 pounds.	36¼	37	23⅝	19⅞
TOTAL STRAW PER ACRE—CWTS. OF 112 POUNDS.				
Without manure	11½	16⅛	.....	.....
Mineral manure alone	12¾	18⅞	1⅜	2¾
Ammonia salts alone, 400 pounds	19½	26½	8	10
Nitrate soda alone, 550 pounds	24¾	26½	13⅜	10½
Mineral manure and ammonia salts, 400 pounds	33⅜	44⅜	22⅜	28½
Mineral manure and nitrate soda, 550 pounds..	41⅜	45	30⅜	28⅜

Experiments with Barley, grown year after year on the same land:

Manures per Acre.	*Rothamsted Average Produce*	*Woburn Average Produce*	*Increase by Manure*	
			Rothamsted	*Woburn*
DRESSED GRAIN PER ACRE—BUSHELS.				
Without manure	17½	27⅜	.....	.....
Mineral manure alone	23½	23⅜	6	4
Ammonia salts alone, 200 pounds	30¼	40⅜	12⅜	12⅝
Nitrate of soda alone, 275 pounds	34	40⅝	16½	12⅞
Mineral manure and ammonia salts, 200 pounds	44½	44¼	27	16½
Mineral manure and nitrate soda, 275 pounds..	47	46⅝	29½	18⅞
TOTAL STRAW PER ACRE—CWTS. OF 112 POUNDS.				
Without manure	9⅞	16	.....	.....
Mineral manure alone	12	13⅞	2⅛	2⅜
Ammonia salts alone, 200 pounds	16⅜	24	6¾	8
Nitrate of soda alone, 275 pounds	19⅜	25½	10	9½
Mineral manure and ammonia salts, 200 pounds	26⅜	27½	16⅜	11½
Mineral manure and nitrate soda, 275 pounds.	29⅜	30⅞	19⅜	14⅞

These experiments, continued for so many years, show conclusively that land which is in arable cultivation, and kept free from weeds can be made to grow a continuous succession of crops of either wheat or barley without any manure, solely by means of its existing fertility assisted by atmospheric influences and the small amount of ammonia and nitric acid brought down in the rain—a yield which will be found to differ but little from the average of some of the great grain-growing countries of the world. Mineral manure alone, supplying potash, soda, magnesia, and phosphoric acid, but no nitrogen, gives but a small increase of either grain or straw. The soils of these experimental farms, like a great many cultivated lands, contain a large amount naturally of the mineral food of plants; they also contain organic nitrogen, that is to say nitrogen in combination with carbon, which is the residue of previous vegetation. This may be termed its inherent fertility, and every year a certain portion of it is converted into nitric acid, and combines with the natural lime of the soil and the lime supplied in the superphosphate, and this to some extent accounts for the increase over the permanently unmanured plats.

By nitrogenous manures—ammonia salts, or nitrate of soda,—applied alone every year, more produce, both of wheat and barley is obtained than by minerals without nitrogen. These results are striking illustrations of the natural mineral resources of the soil, and show that when in what may, in an agricultural sense, be called a grain exhausted condition, the land is decidedly more deficient in available nitrogen than in soluble nitrogenous constituents.

The Rothamsted experiments with both wheat and barley show a marked superiority in favor of nitrate of soda, whether used alone or in combination with minerals and this has been found more particularly the case in dry seasons. The explanation may probably be put down to the greater solubility of the nitrate, to the action of its decomposition and disintegration on the subsoil, rendering it more porous.

In the case of the lighter and more sandy soil at Woburn the disintegrating process is not necessary, and a more slowly oxidizing manure such as sulphate ammonia is sometimes preferable. It is also probable that there would be a more vigorous root-development in the upper layer of the Woburn soils than in the heavy and more clayey soils of Rothamsted. A mixture of nitrate of soda and sulphate ammonia is frequently recommended for certain classes of the lighter soils, and has been found advantageous.

The nitrogenous and phosphatic manures now in such general use are undoubtedly a great boon to the farmer as they enable him, provided his land be well manured occasionally, or be naturally rich in organic nitrogen, to take an extra grain crop in the course of rotation without injury to the soil. For example, barley or oats after wheat, or two or three crops of the same cereal as the condition of the land or the markets may indicate.

SUMMER PRUNING OF EVERGREENS.

WALTER DALTON.

The shortening in and trimming of evergreen trees and shrubs now so commonly practiced by our best cultivators can be advantageously done just at the time the new growth is making, for by taking off the young shoots just as they start no growth is wasted, but all new formation is secured in the desired shape. In hedges and edgings and the few cases where topiary work is still practiced the shears will, of course, be employed, but where there is a limited number of specimens which are wanted in the perfection of their natural forms, by pinching off the ends of straggling shoots, or shortening in with a sharp knife if they have become too tough to manage with fingers alone, a good shape is secured without loss of time. It is a decided advantage to take off undesirable shoots this season, even if so late as not to change the form of present growth, for it encourages the formation of strong buds where wanted for next season, and nature's efforts will not be misdirected by our efforts.

FLOWERING SPIKE OF QUAMASH.

Thick, bushy forms should be encouraged, for even in the pines and spruces a new leader can be started without difficulty, but if the trunk and lower branches become bare it is often impossible to cover them. Get a good mass of foliage about the lowest part and the rest comes easy.

THE QUAMASH.

The Quamash of the Indians (*Camassia esculenta*) is common throughout the northern Rocky Mountain regions. In the early spring the beautiful bluish-purple and violet-blue flowers may be seen covering acres upon acres of the "mountain meadows," in all their native glory. Our engraving gives a fair idea of the appearance of these flowers. In the early spring the plant throws up from the buried, onion-like bulb, narrow leaves about a foot long, and afterward a straight stem one to two feet high which bears the flowers, each of which is an inch or more in diameter.

At one time it was a regular custom with the Indians to gather the bulbs of the Quamash just after flowering, and dry them for future use. They still, to a slight extent, follow this practice. After the bulbs are dried, either by sun cure or fire cure they are beaten into a paste and dried still more, and then preserved for future use. The plant is quite hardy and well worth cultivating on account of its showy flowers.

THE NEAPOLITAN ALLIUM.

One does not look for desirable flowering plants among the onions, and yet there are several species in the genus Allium that are very interesting as ornamental plants. Perhaps the most beautiful of the cultivated species is *Allium Neapolitanum*. Its flowers are white and are produced in large loosely spreading umbels. The leaves are rather broad and sharply pointed and of a dark, glossy green color. This bulb is excellent for the window garden. The best treatment for it is to put three bulbs in a five-inch pot as soon in the fall as they can be obtained. They will

FLOWERS AND BULB OF NEAPOLITAN ALLIUM.

immediately commence to grow and will be in flower in January. A succession can easily be kept up by planting at intervals. It is also a good bulb for the open border, but in that situation needs a slight protection.

A NEW BEGONIA DISEASE.

PROFESSOR B. T. GALLOWAY.

While studying a violet disease in the Government Propagating houses at Washington I noticed some begonias which were affected in a peculiar manner. The leaves, hanging down against the stems, or else rolled inward toward the midrib, fell at the slightest touch. In fact, by giving the plant a slight shake, all the foliage could easily be removed. Upon closer examination it was found that the trouble was for the most part confined to the main roots, also to the stems just above and below the surface of the ground. At the latter point there were frequently found irregularly shaped swellings which, upon cutting open, were seen to consist of small portions

of green healthy tissue intermingled with much decayed matter, the latter being for the most part of a brown color. The roots also were in the majority of cases badly decayed. In Fig. 1 is shown a diseased plant engraved after a photograph taken immediately after being lifted from the bench. Fig. 2 shows another diseased plant with the swelling at *a*. Fig. 3 portrays a healthy plant. Microscopic

FIG. 1. FIG. 2. FIG. 3.

examinations of the affected roots and stems revealed the presence of great numbers of a nematode worm which, no doubt, is the cause of the injury. The striking resemblance of these worms to those found in connection with the root-knot of the peach led me to believe that the two diseases were caused by the same species. Further study of affected begonias fully convinced me of the correctness of this view, which was afterward fully corroborated by Prof. G. F. Atkinson, of Auburn, Ala. These worms, the scientific name of which is *Heterodera radicola*, have quite a complicated and interesting life history. Some of the more important forms of this particular species are shown in Fig. 4; at *b* are seen three eggs in various stages of development, *c* and *d* represent immature worms, and *e* a larva escaping from the egg. These worms are found in more or less abundance all through the affected tissues, and it is owing to their action upon the latter that the swellings and eventual death and decay result. The affected begonias were of the variety Sandersoni. They were planted in the bench, and apparently had received the very best cultivation. The foreman of the houses was much puzzled at the way his plants were dying, and was exerting every effort to check the injury, with little apparent success. His failures, however, in this direction can easily be accounted for, as most of his endeavors at treatment were confined to the soil which, as he expressed it, "was not suitable for the plants." The truth of the matter was, the disease had been in his stock for two years, and in propagating he had, of course, simply carried the trouble along, not thinking that it was in the plants. So far as is known, the disease does not attack begonias in the open air, nor does it seem to trouble potted plants, providing the latter are free from it when potted. It is only in the bench that it is able to spread and produce serious results. Probably the trouble, which is no doubt widespread, could be wholly prevented by propagating only from healthy stock, and using only soil in which no diseased plants have

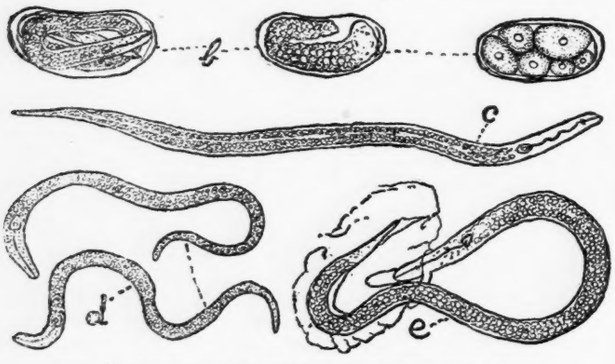


FIG. 4. EGGS AND LARVÆ OF THE NEMATODE WORM.

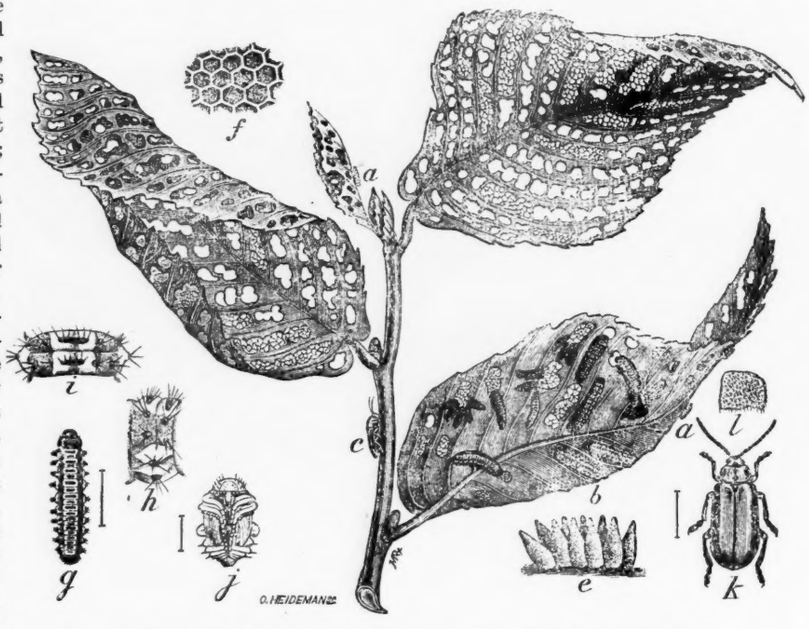
been grown. If it were not for the fact that Sandersoni when grown for flowers does not do so well in pots as in the bench, the former might be resorted to as a means of keeping each plant healthy. Careful selection of stock and soil may check the trouble.

THE IMPORTED ELM LEAF BEETLE. (*Galeruca Xanthomelæna.*)

PROF. C. V. RILEY.

There are few insects about which, at this season, there are more inquiries, especially from Northern sections, than about the elm leaf beetle. This well known European pest of the elm has now become widely distributed throughout the Northeastern States, and is a most serious barrier to the successful growth of this popular shade tree. The beetle affects especially the European elms, some more than others, the European *Ulmus campestris* seeming to be its favorite food-plant, while the common American elm (*Ulmus Americana*) is less subject to its ravages, at least at Washington. It was introduced into the United States about 1837. In Europe it has long been known as an enemy of the elm, and has proved especially injurious in Germany and France.

The general appearance of the insect in all stages, and also the nature of its work, are shown in the accompanying illustration. The eggs, *a* and *e*, are oblong-oval, obtusely but not abruptly pointed at the top, and of a straw yellow color. The surface of the egg is opaque and beautifully and finely reticulated, each mesh forming a regular hexagon, as shown at *f*. The eggs are deposited on the under side of the leaves (*a*) and always in a group consisting generally of two, rarely of three, more or less irregular rows. They are firmly attached to the leaf, and the number in each group varies from five to twenty or more. The duration of the egg state



THE VARIOUS STAGES OF DEVELOPMENT OF THE ELM BEETLE.

is about one week. The general shape and markings of the larva are shown in *g*. The colors are black and yellow. The larvæ are abundant and destructive to foliage from the month of May into August, and in Washington are most abundant about the middle of June. The larval life covers about two weeks. When full-grown, the larvæ descend into the ground and transform into pupæ under any shelter at or near the base of the tree. The pupa (*j*) is of a brighter yellow color than the larva, oval in shape and strongly convex dorsally. It is armed with moderately numerous black bristles, and its duration is from six to ten days. The perfect beetle is pale yellow, marked with black, as shown at *k*. In newly-hatched individuals the black markings have a greenish tint. The beetle assists the larva in its destructive work, doing, however, comparatively little damage. In the Northern States this insect is generally but two-brooded, but in Washington there are from three to four annual generations, according to the character of the season. The adult insects hibernate in any sheltered situation such as hollow trees, cracks in the ground, under old leaves, in the crevices of telegraph poles, and especially in deserted barns and houses, remaining dormant until the following spring.

The older remedies for this insect consisted in trapping and destroying the larvæ and pupæ by the use of oil and tar gutters surrounding the base or body of the tree, or other devices similar to those used against the canker worm. Glover recommended placing about the tree small, tight, square boxes or frames a foot or eighteen inches in height, sunk in the earth, the ground within

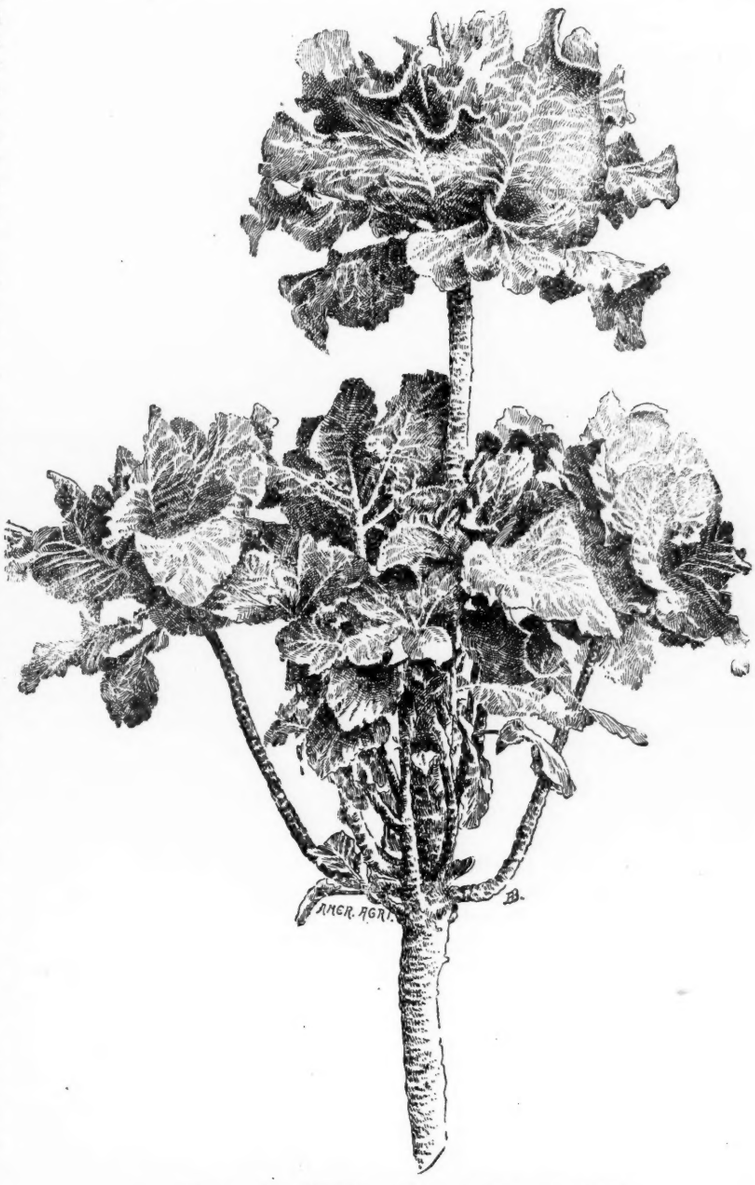
the inclosure to be covered with cement, and the top edge of each frame to be covered with a broad projecting piece of tin like the eaves of a house, or painted with some adhesive or repellent substance, as tar, to prevent the escape of the larvæ. The larvæ descend from the tree and, being unable to climb over the inclosure, change into helpless pupæ within the box, where they can be daily destroyed. In my experience scalding water was found most convenient for destroying the insects that accumulated within the inclosure. This remedy is satisfactory only where the trees are trimmed up properly, because if the branches are low and droop toward the ground the larvæ are apt to descend the wrong way and fall off to the ground, and thus escape the collecting box.

This method, also, requires constant examination and some little trouble, and it will be advisable, in most instances, to have recourse to one of the arsenical poisons—London purple, or Paris green. From a very considerable experience with the use of these poisons against this insect, I have found that it is comparatively easy by this means to control them. Generally two sprayings with the poison will be required, the first about the last of May or first of June, for the latitude of Washington, or at the season of egg-laying. This will destroy the larvæ at the very outset, and also to some extent the beetles, and will measurably prevent the injury from a second brood. A second application three or four weeks later will probably be necessary to reach the second brood, which should not be very abundant if the first application is properly and thoroughly made. It is always best to make the application before the injury from the larvæ has become apparent, as, after the leaves have become perforated and skeletonized the deleterious effect of the poison on the plant from its caustic action is much greater than before the leaves have been much attacked. London purple, or Paris green should be applied at the rate of about one pound to 150 gallons of water, the arsenical being first mixed into a paste and then added to the bulk of the water. Recent experiments by Prof. J. B. Smith have indicated that a small quantity of kerosene emulsion mixed with the wash is of use in enabling the spray to penetrate the pubescence on the under side of the leaves and spread uniformly over the surface instead of collecting in drops. He recommends the addition of a pint of kerosene emulsion to twenty gallons of water. For spraying large shade trees a rather powerful force pump will be required, and forty or fifty feet of hose. The hose should be attached to an extension rod or pole from ten to twelve feet long, and access to the center and tops of trees may be gained by the use of a light ladder. For large trees the spraying nozzles for close work, as the Riley nozzle, will not answer so well, and some form of direct discharge nozzle will be found more satisfactory. The spray will then result only from the force of the discharge, and this should be sufficient to break the stream up into a moderately fine mist, at a distance of ten or twelve feet from the nozzle. The striking against the leaves and foliage will still further break up the spray, and the largest trees can be thoroughly wetted by the use of about fifteen gallons of the mixture. Each community should combat this pest.

COLLARDS AND CABBAGES FOR WARM CLIMATES.

W. F. MASSEY, EXPERIMENT STATION, NORTH CAROLINA.

It is pretty generally known that it is extremely difficult to grow winter cabbage in the South, except in the Piedmont and mountain country. Climate is against them, and insects are more various and numerous than in the North. But we have not yet given up the hope of solving the problem of raising good winter cabbages here. One of the reasons for failure is the habit of continually getting seed from the North, and neglecting to develop a variety native to the soil and climate. Those of us whose garden experience goes back thirty-five or forty years can well remember when, even at the North, the regular and uniform heading of a patch of cabbages was a matter of considerable uncertainty because of the practice, then common, of using European seeds. Since the use of American grown seeds has become common the cabbage crop has become a more certain thing than it ever was with foreign seeds. So we may hope yet to do something in this line in the South. The only form of the cabbage that has been found to withstand our climate is the collard. Now, as the collard has been grown in this climate for generations, why not use it as a starting-point for a new strain? This object in view, I made a request in a leading Southern paper for contributions of collard seed from ...y who have seed they considered superior. The answers to my request have been very gratifying, and I have received packages of seeds from all over the South. And what more than ever convinces me that I am on the right track are the statements made by several contributors of seed, who say that by careful selection they have brought their collards to heading very uniformly, one gentleman assuring me that his regularly produce heads over nine inches in diameter.



A FULL-GROWN COLLARD PLANT.

To most Northern readers the collard is an unknown vegetable, lightly passed over in seedsmen's catalogues as a "non-heading variety of cabbage grown in the South," and but few of them know that when properly blanched even the loose, unheaded collard is a vastly sweeter and more delicate vegetable than the Northern cabbage. Therefore, if it can be induced to head and bleach with certainty we will have no cause to regret most of the coarse, large cabbages. There are several varieties grown from the dark purple leaved, green leaved, to a variety with a loose, open head, but self-blanching. I believe that we have at the Station the seed of the cream of all the collards from Texas, Louisiana, Mississippi, Georgia,

and North Carolina, and may count on good results. In the meantime I am by no means satisfied that the best of the Northern cabbages cannot be grown here. The general practice with growers here is to sow cabbage seed in the spring, just as truck farmers at the North do, and transplant in July, and then when the cabbages succumb to the long heat and drought, and the swarming insects, conclusion is reached that we cannot grow cabbages for winter use in this climate. Last summer I sowed seed of Late Flat Dutch cabbage the middle of August. The plants were set out in September. But the autumn was uncommonly dry, and I feared at one time the experiment would be a total failure. Yet in spite of all, and in soil of only moderate fertility, very fair heads of cabbage were made by Christmas. Had the season been as rainy as usual the crop would have been very good. Now here, it seems to me, is a good suggestion to Southern planters. Sow the cabbage seed not earlier than the last of July. Set the plants in ground naturally moist, manure very heavily, and work rapidly, and good cabbage can be grown in most seasons. Then, after succeeding in getting good heads, save the best for seed, and develop a strain suited to your wants.

The cabbage, a native of a cool, moist climate, must necessarily degenerate in our hot summers, but in most places in the South all kinds of cabbage thrive from October to May. We grow early cabbage for the North in great quantities, and by bringing our winter cabbages into the earlier part of the cool season I can see no reason why we may not grow them as well as the spring crop. So, while holding the collard to be a "survival of the fittest" in this climate, and the proper stock to work on we will not altogether abandon the hope of profiting by the skillful selections of generations of seedsmen as represented in the best sorts of heading cabbages.

[The illustration herewith is an exact representation, engraved after a photograph, of a specimen collard plant exhibited at the sub-tropical exposition at Ocala, Florida. The stem was four feet high, and the height of the entire plant was eight feet.]

CULTIVATING FRUITS FOR FLAVOR.

WEBB DONNELL, MAINE.

In the eagerness to secure highly-flavored varieties of strawberries, raspberries, grapes, and other small fruits, as well as of pears and apples, a very important fact is likely to be lost from sight. It is true that the best varieties of all kinds of fruits, vegetables, and cereals should be sought when one is planting an orchard, making a garden, or attempting to raise any kind of agricultural product, but it must be remembered that the matter of variety is no more important than the culture which the plant or tree receives. The most highly flavored strawberry becomes insipid when starved in growth and choked with weeds. Two apple trees of the same sort and equally vigorous at the start will bear fruit that will scarcely be recognized, by the taste, as related to each other. The one grows in a roomy, well-fertilized, and well-cultivated garden, and the other produces its fruit with sod-bound roots, in a sterile soil, and closely crowded among other trees, so that what sunshine reaches its branches has to steal in by devious ways. Many people with each returning spring set out some new variety of fruit that is highly recommended, and then, after a season's or a number of seasons' careless or improper management, they claim that it is of "no value." Delicious flavor, whatever be the fruit or vegetable, is promoted by the best conditions of growth; and this means good soil, well drained and fertilized; thorough cultivation; proper thinning of the fruit so that what remains may receive the vigorous strength of the plant, and especially a full supply of sunshine and pure air. Fruit must have sunshine to develop fine flavor, and it is folly to economize in garden space by planting rows of small fruits between rows of apple or pear trees, to remain after the latter have attained large growth. It is not enough that the sunshine can come down upon the tops of plants or bushes from above, sufficient as that may seem to some. It must have access freely to every part if perfect quality is desired. Free space for the roots to work, and plenty of fertilizing material to feed upon, will assist in forming perfect fruit. "Plenty of fertilizer" means just enough and no more, for some plants, if fed too highly, run too much to woody growth. Care should be taken also to apply dressing after growth ceases in the fall, or in the spring when it is starting, to avoid the winter-killing of new growth made late in the season. A serious mistake that one sees in many orchards, in passing through the country, is the crowded condition of the trees. They are so small and the space between them seems so great when the orchard is laid out that unless one follows such definite rules as to distance, as owners of fully developed orchards can give from their own experience, he will be almost sure to have a crowded orchard in the years to come. Crowded orchards produce fruit, as a rule, that is not up to full flavor because the sunshine has not a chance to perform its full mission. Where the evil exists an ax should accompany the pruning saw on its rounds among the trees. In such cases the space occupied by some of them is worth more than the trees, and those that remain will produce better fruit, and in many cases as much of it as the orchard bore before thinning.

AN EASY WAY TO GROW ASPARAGUS PLANTS.

J. K. REEVE, OHIO.

In making an asparagus bed the probabilities are that the first attempt will not bring quite the desired measure of success. It is not a difficult matter to plant and cultivate asparagus properly after one knows how. But in this, as in most other work of the garden, a little practical experience is worth more than a large amount of theoretical teaching. There is the danger of planting too closely, or of not fertilizing sufficiently, or of planting on soil so weedy that proper cultivation can never be maintained, or of not setting the plants deep enough and as a consequence having the crown always work toward the surface, or of breaking the crowns and roots during cultivation, and so checking the productiveness of the plants. If any or all of these things happen, do not give up asparagus growing in despair but keep this first bed to experiment on, giving the best care that you can in the way of fertilization and cultivation, and study the habits and manner of growth of your plants, and meanwhile prepare to get a new bed speedily, and without great expense. Let the stalks grow and remain standing this fall until the seeds have fully ripened. Then cut them down and whip the seeds off upon the bed; give a light cultivation with the spading fork and then even with manure.

Early in the spring innumerable small, feathery tops will begin to shoot up, each one showing where a seed has lodged and taken root. By June there will be a well-developed plant, which may be taken up and set in a rich bed, to get further growth before being permanently transplanted, or they may remain where they are until autumn. If reset early and in very rich mold they will make sufficient root-growth to warrant placing them in the permanent bed the following spring. During the winter these young plants should be heavily mulched, as they show a remarkable tendency to "heave out" by the successive freezing and thawing of the ground. The old plants show a similar tendency to force their crowns to the surface, and for that reason, no matter how deeply set, care must be taken in cultivating to avoid running the cultivator or fork directly into them. Another danger that besets the inexperienced grower, and that is a frequent cause of ultimate failure, is that of cutting too close during the first years. Do not cut at all for two years, cut lightly the third, and moderately the fourth, and after that as much as you will. A little self-denial in this way is repaid a thousandfold by subsequent abundant productiveness.

NEW METHOD OF TRAINING HEDGES.

J. G., PENN.

Nothing is more attractive around a place than a well-kept hedge. But there is no beauty in a hedge row unsightly and untrimmed, with part of it dead, other parts tall and ungainly. A new method of training hedges is meeting with favor and success in some parts of the country. The first step is to plow and manure the strip of ground heavily where the hedge is to be planted. Osage orange sprouts of a year's growth are then planted eight inches apart, and the ground kept mellow and free from weeds the first season. The next year the sprouts are braided on a flat sinuous iron fencing rod stretched horizontally about six inches from the ground. The next growth of sprouts of course grows straight up, and the second season another of the rods is fastened in the same way, and likewise the third. A hedge of this kind was planted three years ago in this place and now is complete, and a more beautiful fence would be hard to find. The growth is from the ground, and is compact clear to the top, and no animal can get through it or over it. It is wide at the base and slopes upward. An old hedge row running along the highway was cut down close to the ground, and the following season when the sprouts came up they were braided as described above. The sprouts from this old hedge grew seven feet in one season, of course making from the large mass of roots a much more rapid growth than those from the young cuttings, and producing a neat and attractive appearance.

TWO GOOD SUMMER FLOWERING BULBS.

The Spanish Lily (*Pancratium caribœum*) is not a true lily, but if planted out, according to the season, or potted for the greenhouse, will grow and produce an umbel-like cluster of numerous flowers. The individual flowers are pure white, and usually fragrant, each with a long and slender tube, which splits above into six narrow divisions. There are six long and conspicuous stamens, which are connected by a cup-shaped crown, extending from one to the other, and adding greatly to the beauty of the flower. There are other species of the Spanish Lily besides that shown in Fig. 1, some of which only open their flowers at night, or in cloudy weather. If the bulbs

FIG. 1. THE SPANISH LILY.

can be obtained in the spring they may be planted in the open border, where they will produce an abundance of flowers. If purchased late the bulbs must be potted for the greenhouse.

Montbretia Pottsii is the best cultivated species of a small genus of plants belonging to the Iris Family. The species came originally from the Cape of Good Hope, and are, in the language of florists, called "half-hardy." The species illustrated in Fig. 2 somewhat resembles the gladiolus, and is a summer flowering bulb. The flowers are borne on spikes from six to nine inches long. They are bright yellow, streaked on the outside with brick red. Another Montbretia, a handsome, hardy hybrid, raised between *M. Pottsii* and *M. crocosmia aurea*, is a favorite with many. The funnel-shaped flower is an inch and a half long, with a slender, curved tube and a spreading, six-parted, orange-scarlet limb. The erect panicle is many flowered and bent in a zigzag fashion. It remains in bloom from July until killed by the frost. It is a most desirable flower for the open garden, but its usefulness stops there, for the flowers quickly fade if used in a vase, and the buds do not open. *M. Pottsii*, on the other hand, is remarkable for the length of time its flowers remain in perfection. It is useful for cut flowers also, especially because its spikes have not the stiffness and formality of some related plants. This genus is closely allied to Ixia, and is placed under Tritonia by some authors. Most of the Tritonias thrive in a cool greenhouse and when grown in pots they require plenty of water during the period of growth and a light, airy place close to the glass. Both of these bulbs should be taken up and kept in dry sand, free from frost during winter. They increase rapidly from offsets.

PRIMROSES AND PANSIES.

MAY FROST, CANADA.

With proper treatment, primroses bloom ten months of the year. In spring I sow a packet of mixed seed in a shallow box in the window, cover them very lightly with soil, wet the soil thoroughly, and cover the box with glass, raised a little to admit air, and removed entirely after the plants are up. When the plants are an

FIG. 2. POTTS' MONTBRETIA.

inch high I put them in five-inch pots in light, rich garden soil, and set them in a cool window with northerly exposure. I give them plenty of water, taking care not to wet the leaves or flower stems. The first of May I set them outside and water sparingly until danger from frost is past, then I plant them in the ground in the flower garden in a shady spot, and they bloom all summer. In the fall they may be potted again, but I prefer raising young plants every year.

Pansies are so beautiful and are so little trouble to grow that they ought to be found in every flower garden. I live away up on the north side of Pinnacle mountain, and have no trouble in keeping them through the winter. If the little plants grow too fast and get spindling I transplant them into another box. When the weather is warm I plant them in the ground. I have sown seed as late as August and it has produced flowers by fall, and fine plants for the next spring. The soil should be light and rich, but they will grow in any soil if it is rich enough. In the fall after the ground is frozen I cover the plants with hemlock boughs, and when the snow thaws off in the spring there is often an abundance of flowers. In the house I grow them in tight window boxes, and give them all the sun possible, and plenty of water. The flowers have to be pinched off as soon as they commence to fade else the later flowers will grow small and the plants will soon die. Any one who has a little plat of earth that the sun shines on can grow these beautiful flowers, at an outlay of but a few pennies for seed.

True Pictures of Country Life.

S. JENNIE SMITH.

To know a real farm life one must actually live it. Dairy fairs and poultry shows present only an ideal. The animals there on exhibition are the most expensive as well as the most beautiful that the land affords. Scores of trained workers perform the labor which one or two must accomplish on an actual farm, and results are produced at an outlay for labor and appliances that are far beyond the means of even well-to-do farmers. The ordinary chicken-yards and stables are very different affairs, demanding the strongest of boots and clothing.

Farm life is a hard life, and it weighs more heavily on the women than on the men. On the wife of the farmer falls the entire care of the household, always made larger by the addition of hired farm help. She has few of the conveniences which lighten toil in the city. Water must be pumped or drawn from cistern or well, these being not in all cases near the house. And it is too often her work to carry in the fuel. The table supplies in the country are a source of great care and trouble. People are not contented with the salt pork, rye bread, and molasses cake of our ancestors, and the procuring and preparing of a variety of dishes, with the butcher's visits at intervals of a week apart, the grocery miles away, and the bakery a minus quantity, is a task that the city wife with all her resources cannot understand. Eggs, vegetables, and the products of the dairy are her only dependence, and the outlay of money and labor that they cost is a fact unknown or generally misunderstood by those who have never aided in their production. The scattering of a few seeds is all that is supposed to be necessary for the raising of fresh vegetables, and cows and chickens are of course expected to give milk and eggs free of expense. Churning and butter-working is harder labor than one would imagine, and accompanying these duties are the caring for the milk and keeping all utensils employed therefor scrupulously clean. Hens do not, as is supposed, forage around and supply themselves with food, but must be carefully attended to and well fed, or disease is the result. "I declare!" exclaimed an old country lady, "city people think that eggs, and milk, and butter grow down the cellar, all ready to bring up on the table."

"I cannot help envying you your delicious vegetables," said a city guest to her hostess; "I never feel that I am imposing on country housekeepers by making a long visit, because nearly all their living they get from their own place, and don't have to pay anything." Her hostess said nothing in reply. She had no desire to seem inhospitable, but she thought of the money expended in seeds, fertilizers, and labor; also of her own aching back and dizzy head as she gathered the vegetables that called forth the praise.

The steady round of work, with little rest or change, wears upon even strong systems. Ask persons who dislike living on a farm what their reasons are, and in almost every case they will attribute their dislike to the abundance of work and the lonesomeness. As a rule, only the young are anxious to get away and try new surroundings and occupations. The middle-aged and old have settled down into contentment, or at least are resigned to their fate. They may have had their ambitions, but these have gone with their youth. They feel that the outside world is dangerous, and so prefer the steady-going, plodding life to an advance into anything new. But they often happily fail to realize their deprivations.

And yet, all things considered, actual farm life may be the most joyous as well as the most independent of existences. The deprivations are so apt to be remediable and the advantages so real. Division of labor in manufactures, while perfecting the workmen, has made him subject to the monotony of doing over and over the same thing. In the farmer's life every day brings change and varying interests, and from the seed to the mature corn in the ear he may watch the miracle of vegetable growth. It is his own fault, and not the fault of his position if the sordid desire of gain fills his mind to the exclusion of nobler thoughts. Would his crops grow the less thriftily if, in addition to his knowledge of soils, fertilizers, and cultivation, he should add a knowledge of the plants themselves and their methods of growth? Would he lose anything in dollars and cents if he stopped a moment in his work to look at the expanse of blue sky above the stretch of green field to note the varying colors of the autumn wood? Of course to the farmer's wife and daughter comes the wearing routine of housework, but they may, and generally do, have some outdoor occupation, and the sweet influences of nature may come into their hearts and lift them above the petty cares of every-day life. The love of nature is inherent in the hearts of most women, and the farmer's wife already overburdened will toil faithfully to brighten house and grounds with flowers, doing the work with her own hands that her husband might easily do for her. But few farmers can be found who take an interest in the cleanliness or beauty of their places. Fences grow rickety, lawns are overgrown with weeds, trees need trimming, and piles of debris collect here and there, but the man goes calmly on planting his seeds and gathering his crops, indifferent to the appearance of his grounds. And yet it is so easy to have a beautiful home in the country. Perfect tidiness and a few inexpensive plants will transform the humblest place into a veritable Eden.

If only so many weary yards of piecrust did not have to be rolled; if husbands and fathers could see the necessity for help in the house as well as on the farm; or if wives were a degree less self-sacrificing, more time could be spared for communion with nature, and country women would not be mentally and physically old at forty-five. All through the year every week brings changes, and one can scarcely decide which season is the most beautiful. The tender green of leaf and grass, the delicate colors and scent of fruit blossoms, the music of returning birds charm the senses in spring time. Could melody and beauty be more complete than when uttered in the robin's morning song from a full-blooming apple tree? Does the world ever show so fair as when seen from the top of a fruit-laden cherry tree? The fields of waving grain, the cry of quail and whip-poor-will, the chirp of insects in the grass, the orchards with their ripened fruit, and the splendor of the autumn woods, each in turn challenges our attention.

"Nothing ever goes on in the country" is the complaint, while myriads of activities are at work all around us. Wonders are being performed in field, and wood, and pond, while eyes are closed to them. A certain number of young people fondly recall the visits made to a kindly gentleman who chose the onerous duties of a country doctor to a more exalted career in the city because he loved Dame Nature. A devoted microscopist, night after night he could be found busy with the fascinating instrument, often surrounded by an appreciative group that gazed at the wonders revealed under the glass, and drank in the words of wisdom from his lips. He was asked one day, "Don't you think it a pity that these beauties are not more apparent, so that all might see them?"

"No," he answered, "we must delve for jewels, and we prize that most which costs us an effort."

"How learned you are!" was said in praise to him once when he examined and classified a rare specimen.

"Not learned," he replied, "but interested. When I meet a little creature like this I wish to find out its name, so that I may say 'how do you do' the next time we meet."

Well would it be for other rural communities if they could have such a man in their midst. But the book of nature from which he read is open to all, and patient observation, and collecting and comparing specimens of nature's work will reveal unsuspected beauties even without the aid of a powerful and expensive instrument.

Impure Water—How to Recognize it.

D. WEBB.

Almost every one is aware that diseases are contracted and spread by the use of impure water. Not every one, however, knows how to recognize this insidious foe to health. It is unfortunate that water containing deadly germs of disease may look as sweet and sparkling as the purest that falls from the clouds. The chief impurity to be dreaded is contamination by organic matter either animal or vegetable, which is caused by decaying matter of either sort being washed out of the soil, or from the surface of the soil, into the source of supply.

The simplest test for this is to boil away a gallon of the water in a perfectly clean vessel,—glass, tin, or agate ware is preferable, as iron would not readily show the color of the residue. If this residue is black or dark brown it shows the presence of organic matter. In testing in this way the water should be taken from the top of a considerable body which has been undisturbed for twenty-four hours, that all mere earthy sediment may have settled out. This is particularly important in the case of running water which may carry along much earthy matter that would give a dark sediment not necessarily organic.

Many have doubtless noticed the odor of ammonia, or "hartshorn," where change or decay is taking place in organic matter. This odor is particularly prevalent about stables where ventilation is poor. If decaying organic matter finds its way into water it naturally follows that the water will contain ammonia. When impurities are discovered their source should be found and the cause removed. Care should always be taken when any chemical test is to be made that none of the materials used get upon the clothing, or flesh, or into the mouth.

Baby's Corner Lot.

ANNIE HAMILTON DONNELL.

Over in the corner of the room a wee, wee housekeeper is keeping a wee, wee house, and a busier, blither little housewife never was. I can watch her while I write, and be in readiness to run to her assistance if any sudden exigencies arise.

It occurs to me that this housekeeping plan of mine may possibly be helpful to another mother somewhere in the wide world, though I surmise that its counterpart may have been discovered since mothers ever had baby hands to keep busy and baby feet to keep in safe places. Maybe Mother Eve made a little "house" for her baby in a corner of the beautiful garden.

My little woman's house is just and only a corner of the room, walled in by the sofa and two chairs; that is all. But the amount of comfort to her babyship and me that the wee bit house affords is big enough to fill a palace. There the little lady is sure to be safe if something needful calls me out of the room. The walls of the house are strong and trustworthy, and still they will let in the blessed sunshine, and air and light, and admit of a vast deal of comfortable peeping over and peeking out that in itself is a source of delight to the little housekeeper's two round blue eyes. The chairs serve a double purpose. They make a beautiful cane table for the little one to lean on and walk by, and fill all full of her household lares and penates, the rubber babies and balls, and the blocks, and pictures, and spools. Another advantage my house possesses is its movable character; because I can tear it down and build it anew in some more fashionable quarter, and a new house is a new delight always. I have read of the padded boxes some mothers have for their babies, but it seems to me they might be too dark and lonesome. The little folks are such a sociable race! They love to be able to see mamma whenever the mamma hunger strikes them, and they love to hold up their bits of household utensils for mamma's admiration over and over again. I suppose there are baby-houses and baby-houses from the rising to the setting sun; and doubtless those just like mine are legion. But it will do no harm to share mine a little, anyway. And I do surely get so much comfort and help from it; most of all because I feel safe about my baby when she is in it. When I tell you that my housewife is only a year and a quarter old, and just learning the use of her two little feet, you can see that the walking about her house by the aid of the walls thereof is no small help in the perilous lesson of learning to walk. And the tugging up and down, and the scrambling hither and thither, are fine exercise for the hundred and one little muscles.

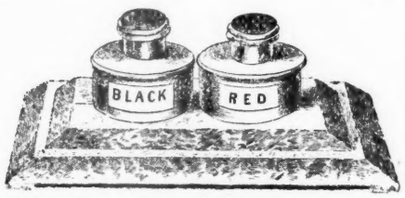
To be sure the room does not look quite as well when the house is kept built all the time, but it's the all-the-time of it that is its chief sphere of usefulness. When it is ready at any minute, why, if the door-bell rings or the apple-sauce boils over

and threatens to burn, there is a safe haven to tuck the little lady into while you run off to set matters straight. What if the sitting-room does look a little "cluttered?" The baby comes first and last, and if any of your callers cannot appreciate the baby, I believe if I were you I wouldn't let them in at all!

Then this baby-house is easily unbuilt, and there is another advantage. A little hurrying and skurrying; that is all, and lo! the sitting-room is as prim and proper as ever. One more recommendation, and then I will let the little house win its own way. By and by, when the baby gets tired of housekeeping all alone, then don't you see what a beautiful place the lounge wall of this house is for mother to rest her baby and herself in, while she can peep over the wall and kiss the little housewife or houseman into comfort again? Then, while she rests, the housekeeping goes on with renewed vigor and delight. A little horizontal resting will never come amiss to any mother. It is a mother's glory to be tired—mother-tired.

For the Writing Desk.

The illustration shows a convenient and ornamental inkstand for home construction, adapted to hold common small ink bottles. It consists of bottom and top boards, each five-eighths of an inch thick. The bottom board is nine by five and a half inches, and beveled all around the edges;



A HOMEMADE INKSTAND.

upon this the bottles rest. The top consists of two halves. Into each are cut two half circles, which are made to fit nicely around the two bottles to keep them in place. The outer edges of the top are beveled like the bottom. Before fastening together cover the three pieces of wood with plush or velvet, tacking the edges under side. Four one and one-eighth-inch screws from the under side fasten the whole together.

A Horseshoe Pen-Rack.

The pen-rack illustrated is convenient and ornamental as well as easy of construction for home

FOR PEN-HOLDERS.

work. It is made as follows: Cover with plush a piece of board seven by nine inches, or larger. Bronze or gild over a horseshoe and eight nails. Place the horseshoe, ends up, well down on the plush-covered board. Through each nail hole tack a nail into the wood sufficient to hold fast the shoe; also leaving the heads of the nails out far enough to hold, horizontally, four pen-holders, each resting on the heads of two nails. A bracket behind holds the whole upright. A further ornament of hand-painting represents sprays of flowers issuing from the ends of the horseshoe.

Parlor Novelties.

ANNA HINRICHS.

Fashion's latest dictate commands a conspicuous pincushion in the parlor. It is made to hang, and

FIG. 1. HANGING PINCUSHION.

should represent a perfect dream of ethereal daintiness. The illustration (Fig. 1) is a suggestion in pale blue brocaded satin, with a fluffy garniture of lace and ribbons. This may be made of the now so popular combination of white with gold, but of course soils more readily.

An artistic decoration for a mirror having an old or defaced frame is accomplished with the grace of a couple of fans in neutral tints, peacock feathers, and a drapery of flowered China silk. Fine green tarletan is less expensive, and fully as pretty. Should the glass be cracked or broken near the frame the defect may be entirely concealed by the drapery. (Fig. 2.) It is a pardonable supposition that all imaginable designs in sachet-bags have already been devised. However, here is an entirely new style, of "French Pompadour" origin: Take a yard of soft silk, sew it up lengthwise, and fill it with scented cotton. At a distance of twelve inches it is fastened to a large white bone ring, for hanging. The shorter end is rounded with cotton into a ball, and is finished with loops of ribbon. The longer end of twenty four inches is left in the form of a flat bag, and is finished with bangles.

FIG. 2. MIRROR ORNAMENT.

A unique receptacle for invitations and the like is constructed of two palm-leaf fans. (Fig. 3.) The inner faces are gilded; the sides facing out are covered with plush, decorated, and draped with gauze and ribbons. The fans are fastened three inches apart to a foot or support of reeds. In case reeds cannot be obtained, extra fan handles answer the purpose.

A dainty bag for holding fine needlework proves a convenience at social gatherings where fancy work fills a part of the programme. The outer case of plush is stiffened with a lining of linen canvas, and decorated with ribbon embroidery or simply the monogram. The lining is of moiré silk, with a deep frill of the same at the top. Finish with cord and tassels as draw-strings. (Fig. 4.)

An original sofa cushion has the charming effect of being loosely wrapped in a little blanket of contrasting color. The pillow is squarely placed in the diagonal of the blanket, which is a trifle smaller in proportion. In this manner the four corners meet in the center of the cushion, where they are tied together with a bow of ribbons of the two colors used. The cushion being the larger, its corners show along the four tips of the overlapping blanket. The most pleasing effects result in using extreme tints of the same color. A serviceable combination is a blanket of seal brown, exposing a cushion of yellow. Sea-foam combined with hunter green is also practical.

Arranging Flowers.

MARGARET KENNEDY.

A quantity of small white flowers is one of the prime requisites of successful bouquet-making. Candytuft, sweet alyssum, ageratum, white phlox, and gypsophila are invaluable for separating colors which do not harmonize. If white flowers cannot be obtained, substitute delicate grasses and leaves or ferns. A circle of ferns curving outward is a very pretty addition to a bouquet.

Roses and purple flags are both royal flowers blooming at the same time; arrange them together, and the effect is not tasteful. Arrange the roses simply with their own green leaves, or with syringas or other white flowers, and the flags with grasses, or with yellow roses only, and each arrangement is pleasing to the eye. Even wild orange-colored lilies look well with airy grasses—nothing else will combine with them. There are few if any flowers to associate with the queenly white lilies. Keep them by themselves. Some lovely combinations are daffodils and tulips, water-lilies and ferns, red and yellow honeysuckles, snowball and honeysuckles, pink roses, cardinals and mignonette, yellow roses and ferns. The white ageratum put with them takes away that

FIG. 3. CARD RECEPTACLE.

stiff look which zinnias (so valuable for their late blooming) ordinarily wear. Often two or three flowers loosely arranged are more charming than a great number closely massed.

Avoid highly colored vases; white, stone-colored, or a delicate shade of green are best. A tiny vase of glass or silver, for holding one or two choice blossoms is a treasure. A pretty arrangement can be made by putting a spoonholder or celery glass on a plate, filling the one with long-stemmed flowers, the other with short-stemmed ones,—a few vines adding much to the effect. Really beautiful are glass plates filled with balsams—only remember the great law of harmony of color and arrange the rose-colored and purple ones in different dishes. (Keep the forming seed vessels pinched off and the balsams will furnish

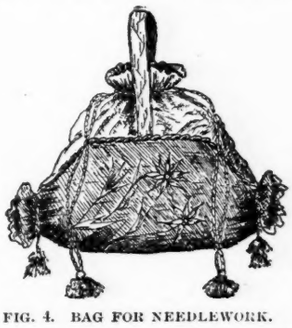


FIG. 4. BAG FOR NEEDLEWORK.

an endless supply of flowers.) Even a cake-stand upside down is not to be despised—and who would suspect it?

Boutonnieres should never be made of flowers that wilt easily, as verbenas, while phlox retains form and color well. Do not forget something to give fragrance. Remember the chief charms of a

buttonhole bouquet is in its daintiness and fragrance.

Should drought or weeds, "those dreadful chickens," or mischievous children rob you of blossoms, do not despair. Dame Nature was never known to be too poor, even in severest droughts, to give you flowers of some kind. The loveliest bouquet I saw last year was gathered along a country road, and arranged in unstudied grace by a little country girl; but it is impossible to combine purple, white, and gold so that they will not be beautiful.

Irish Star Lace.

FRANCES H. PERRY.

This is an exceedingly pretty pattern and much more easily crocheted than one would think at the first glance. The stars are made first and joined together, one by one, as they are made, by linking two picots of each star through the two side picots of the preceding star (each picot consists of three chain). To join one picot to another draw the second stitch of chain through the finished picot to which it is to be joined, then chain one and

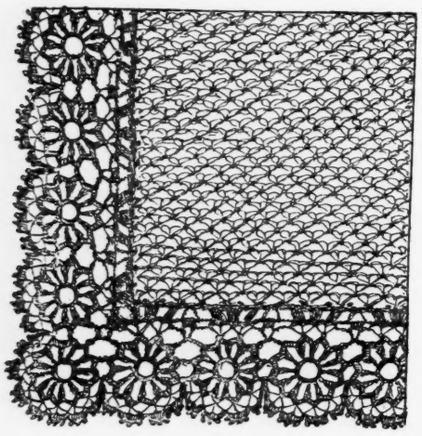


FIG. 1. PART OF PINCUSHION COVER.

finish as usual. The effect of the heavy center ring in each star is much handsomer than when a chain is used for the foundation, and there are no ends left to fasten. Four lengthwise rows are crocheted for the heading and two more along the lower side complete the handsome scallops.

To make a star, wind the thread twenty times round the end of the little finger, slip the hook under, from right to left, and draw a stitch through, then a stitch through that (like a double crochet), draw up closely and slip the ring smoothly off the finger, chain three, work one single crochet in first stitch of chain (for a picot always take up two threads), four double crochet over ring,* a picot, four double crochet over ring, repeat from star ten times, one single crochet in first double crochet to join, remove the hook, put it through the first picot and slip the dropped stitch on the hook back of the picot.

Second round: Chain three, three treble in same picot, chain three,* four treble in next picot, chain three, repeat from star ten times, one single crochet in top of three chain to join.

Third round: Chain one, four double crochet over first three chain, a picot, four double crochet over same chain, repeat from star over every three chain around the circle, join with one single crochet to first stitch of round, break off the thread—leaving a few inches with which to fasten with a needle—and draw it through the last stitch.

Make the second star the same until all finished but two picots; then join to the first as directed; the next star is joined to the two picots exactly opposite those joined to the first star.

First row of heading: In each star call two points upper picots and the other two corner picots. Fasten the thread in the first corner picot, chain six, one long treble in same picot, chain one,* long treble in next picot, chain three, treble in same picot, chain three, long treble in same,* chain one, repeat from star to star in next picot, chain six, double crochet in corner picot, chain one, double crochet in corner picot of next star, chain four, turn and work one treble in fourth stitch of sixth chain, chain one and turn back; repeat all directions from first star until the row is finished. Carry the chain down the side or end of the lace, working in stitches enough to keep it straight and even—one double crochet in each of the two end picots with four chains between, chain two after the last one, then begin the first row along the lower edge.

First row for border: Star one chain, one long treble in first picot, three chain, one treble in same place, three chain, one long treble in same place; repeat from star three times—once in each picot of scallop, chain one, one treble in base of next picot (where two stars join), one treble in base of adjoined picot. Same for next and all succeeding scallops.

Last row for border: Fasten the thread in one chain at beginning of first scallop, four double crochet and three short treble over first three chain, a picot; three short treble, a picot, four double crochet over next three chain; one single crochet over one chain; star four double crochet, a picot, three single treble in next three chains, a picot, three single treble, a picot, four double crochet over next three chain, one single crochet over one chain; repeat from star twice, and repeat once more, with the exception of the last picot; single crochet between the two trebles at joining of stars. Same around each scallop.

Second row of heading: Star four treble in space between the two long bars coming from the corner picots of star, chain one, four double crochet in first opening of double loop coming from upper picot, chain one, four double crochet in the other opening of same double loop, chain three; four double crochet in each opening of next double loop with one chain between, chain one; repeat from star throughout the row.

Third row of heading: Beginning with the cluster of four treble work one long treble over the one chain before it, chain one, one long treble over the one chain after it, chain two, three treble over next one chain, chain two, five treble over next three chain, chain two, three treble over next one chain, chain two, repeat from beginning.

Fourth row of heading: Four double crochet over first two chain, chain two, pass three treble, three double crochet over two chain, chain three, pass five treble, three double crochet over two chain, chain two, pass three treble, four double crochet over two chain, pass without chain over the two long treble, repeat from beginning.

This design is beautiful in white or cream cotton, and also in colored linen or silk for trimming dresses, aprons, etc.

Short treble—Thread over once, then work like double crochet.

Long treble—Thread over three times.

The accompanying illustration, Fig. 1, shows one

FIG. 2. CHAIR THROW.

of the many uses to which this beautiful lace is adapted. It here forms a part of a crocheted cover for a square satin pincushion. Such covers are popular as they are handsome, removable and easily laundered; they may be pinned squarely over the cushion or be placed cornerwise and secured by small bows of narrow satin ribbon. The bright satin of the cushion gleaming through the openings of the cover shows off the work to good advantage. The engraving, Fig. 1, shows nearly the whole of the center piece, also two sides and one corner of the border—though more stars may be added to make a larger square if required.

First make twenty stars for the border, uniting them, as shown, by two points at each side, except at the corners; there only one point of the corner star is left between those joined to the side stars (which leaves seven points outside); there will be four stars for each side and one for each corner. Inside the stars work the four rows for heading; make allowance for the shape at the corners by catching together three star points, instead of two, in the first row; omit enough from the other rows to make the corners come as shown, and add a picot over every opening beneath the last row. The two outside rows require no change—except that there are seven points to work around at each corner.

To fill the center: Make a chain of seventy-five stitches, turn.

First row: One long treble in eighth stitch from hook, chain two, treble in same stitch, chain two, long treble in same, star chain one, pass five, long treble in next, chain two, treble in same, chain two, long treble in same, repeat from star to end of chain, (twelve clusters of three treble each) chain five, turn.

Second row: Pass by the first cluster of three treble and work one star long treble in one chain (taking up two threads), chain two, treble in same, chain two, long treble in same, chain one, pass over next cluster, repeat from star to end, working the last cluster in the first stitch of last chain (twelve clusters), chain five, turn; all rows like the second until enough are made to complete a square.

Sew the border neatly and firmly to the square, being careful not to sew down the picots. The

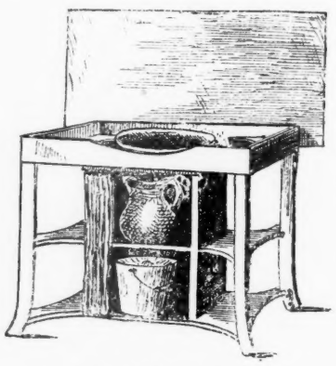


FIG. 1. COMMODE OPEN.

little square of all-over net is the part through which to stick the pins when the cover is in use. Cream crochet cotton is prettier than the white for this work.

The same design, if developed in dark ecru madonna cotton, No. 30, would be very pretty for a tidy or sofa pillow cover. If for the former it should be lined with satin or satine. Should more wheels be added to enlarge the design the chain for beginning of center piece should be lengthened eighteen stitches for the width of one wheel.

The all-over crochet design, Fig. 2, is employed for the novel scarf-tidy or chair-throw herewith illustrated. The stitch is especially nice for the purpose, for the web produced does not "drag" or draw down long and narrow, as many open patterns do. It may be made of crochet cotton—any fast color or white, or coarse spool linen, and underlaid with thin lining silk, if desired—but the model is unlined.

As illustrated it is fifteen inches wide and a yard long, besides the fringe which is four inches deep. Narrow ribbon run through the meshes of the crochet work forms the border along both sides, and a wider ribbon of the same color is tied around it near the center; the ends of the ribbon border are left as long as the fringe at both ends, a few stitches holding them securely where they pass out from the last openings. The fringe—cut eight and a half inches long—is doubled and knotted into every alternate loop along each end.

A Combined Table and Commode.

W. D. WORCESTER.

The exigencies of life sometimes make it necessary that one's sleeping room shall be used as a sitting-room during the hours of daylight, thus contriving a "double debt to pay." Under such circumstances, both for economy of space, and to retain as much of the coziness of a sitting-room as possible, it is desirable to use such furniture as can be adapted to both purposes. A combination of commode, table, and bric-a-brac shelves is shown in the illustrations,—a piece of furniture that may readily be made in almost any home.

The top is hinged at one side, so that it can be raised, disclosing the toilet fixtures beneath (see Fig. 1). When the top is raised, it rests against the wall at an angle of about sixty degrees. At one

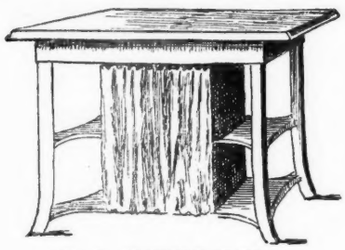


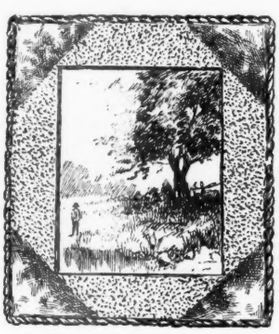
FIG. 2. COMMODE CLOSED.

end, upon the other side of this top, is fastened a small square of looking glass, neatly fitted into the wood. Upon the other end are secured loops of various sizes to hold tooth brushes, nail-brush, hair-brush, comb, and other toilet articles. The closet below has two compartments, with a curtain fitted with rings to slide on a rod in front of it. The shelves at the sides can be arranged as shown in the illustration Fig. 2, or in any other way that one's fancy may suggest. White wood stained with a cherry stain, or cocobola, and then varnished, is a suitable material to use in the construction of this article.

A Bronzed Picture Frame.

MRS. M. J. GORTON.

To make a rich frame for an engraving, photograph, oil, or water color in plush and bronze at trifling cost procure the following materials, which will be much more in quantity than is needed to make one frame, but several frames can be made, and there are other uses to which the ingredients can be made subservient. One-eighth of a bottle of bronze, one-eighth of a bottle of oil, a tiny hair brush (the entire cost about twenty-five cents), and a couple of ounces of pulverized glue. Dissolve the glue by adding warm water. Let the mixture come to a boil; it will be more secure for sticking purposes. Purchase from a quarter to half a yard of crimson plush or velvet. Get a well-seasoned pine board. Saw this, and make a flat frame four inches wide, or have your carpenter make you a frame with a groove in it for glass if it is a photograph or an engraving to be framed. Mark with a pencil the line at which the bronzing ends and the plush is put on. It is a good form to cut off each corner making a right-angled triangle of each corner of the picture frame to be filled with the plush. The space between should now be spread with the glue, and rice grains sprinkled thickly upon it. Let this dry and repeat the process, until quite thickly coated. After drying thoroughly take of the bronzing (mix but small portions of the oil and bronze at one time as the atmosphere soon evaporates the oil and wastes the material) and paint the rice-covered frame most thoroughly. Put several layers of cotton-wadding over the corner, fastening neatly with small brads, and glue the velvet or plush along the edges to the frame. Bronze the edges of the frame. Take a piece of three-eighths



A HANDSOME FRAME.

inch rope, soak in water until pliable and fasten with wire nails to the outer edge of the frame all around, and join neatly near the corner. After it has become thoroughly dry, bronze this also. Put in your glass and picture and hang in that place in your rooms where a bright bit of gold and crimson is needed to relieve the dullness.

Ladies' "Adjustable" House-Dress.

F. P. SCRIBBLER.

An ingenious woman—a semi-invalid, tired of wrappers, robes and loose gowns of all descriptions, after considerable thought and close study of the latest fashion papers, planned and directed the making of the stylish, neat-fitting "adjustable" house-dress herewith illustrated, and the result was eminently pleasing. Her object was to produce a one-piece gown which could be as easily donned and as comfortably worn as an ordinary wrapper, but which could be instantly made to look like a close-fitting costume suitable for any occasion.

FIG. 1. BACK OF HOUSE-DRESS.

The entire lining and the outside of the back are cut by a plain princess pattern. (Fig. 1.) The lining fastens in front with a smooth cord laced over small, flat buttons on each side below the bust. The front of the straight skirt falls in loose folds from three forward-turning plaits on each side, the middle plait on the left side covering a placket opening (which is kept from parting by two small safety-hooks and worked loops), and the bottom is finished with a ruffle gathered to form a self-heading. The guimpe is gathered across the shoulders and neck and brought down in soft folds beneath the corslet portions which extend only to the underarm seams. These corslet fronts are cut by an ordinary corslet pattern, omitting the back forms; they are lined, and kept in shape by featherbone stays—which are easy, flexible and almost unbreakable—at each seam and along the front edges; the closing is accomplished by ten small buttons on each side and a silk lacing cord. By tightening or loosening the fronts, by means of the cords, the dress may be made to vary several inches in size, and yet be always neat and in order; and it takes but a moment or two to make the change. A full puff, cut so as to rise high above the shoulders, covers each coat sleeve from the top to the elbow. In the model (Fig. 2) the corslet matches the dress proper, which is of tan satine with scattered moon spots of castor-brown, while the guimpe and lower sleeve portions are of plain tan finished with collar and cuffs of castor-brown velvet laced with cords and buttons; a narrow cord of the velvet outlines both edges of the corslet. A velvet corslet and a silk guimpe would be handsome should this design be developed in India silk or nice, soft wool goods.

FIG. 2. FRONT OF HOUSE-DRESS.

Tasteful Notepaper.

ELLA ROCKWOOD.

Nothing more quickly stamps the lady of refinement than her note paper. Thick, creamy, unruled paper, with a faint perfume clinging to it which is at once dainty and inconspicuous, with neat penmanship, free from blots and erasures, good ink, with correct orthography, create a far more favorable impression than cheap, flimsy paper, pale ink, incorrect spelling and composition. In lack of a regulation writing-desk, a pretty receptacle for holding writing materials can be made from one of the hinged-lid boxes to be found at the stationer's. Get as roomy a box as you can, then line it with silk or satin of some pretty shade, and either give the inside a generous sprinkling of sachet powder, which is a delicate and lasting perfume, or make a tiny bag as fancifully decorated as you choose, which is to be stuffed with a bit of cotton well sprinkled with the powder and kept in the box with the paper and envelopes. A pen and holder, either plain or elaborate, with a small bottle of ink and a box for postage stamps, complete the contents of the box, which should be kept upon a convenient table or stand for writing.

A Rustic Ornament For Summer Homes.

This is simply an arrangement of several bunches of dried golden-rod, one above another, in a corner of a room, beginning at any convenient height and extending nearly to the ceiling. It is used as a repository for a collection of handsome cards or photographs, which are tucked in among the branches in careless profusion. The golden-rod is first made up into several long-stemmed bunches, or spreading bouquets, each one tied separately with wire or thread the color of the stems. Then, beginning at the top, and inclining them in different directions, the bunches are tied to a slender rod or strong withe, but so loosely that the stalks droop forward and spread so as to fill the corner; a ribbon conceals the fastening of the lower bunch and is tied in a pretty drooping bow with flowing ends. There should be a large bunch of stems at the bottom, even if extra ones have to be added

A DECORATION OF GOLDEN-ROD.

for the purpose. It is kept in position on the wall by tacks driven through the ends of the rod.

No prettier or more useful ornament could be devised for the transient embellishment of a guest room which has some unoccupied, bare looking corner. Neither could a more appropriate adornment be desired for the decoration of the sometimes rather bare walls of rural summer homes to which so many city people resort annually, neglecting to take pictures and ornaments along with them, trusting to luck, woodland treasures and good taste to supply the deficiency. The materials

are always at hand, for where cannot the hardy and beautifully regal golden-rod be found? and who so friendless as not to be the possessor of numberless lovely fringed, frosted, painted, silvered or gilded cards much too pretty to be allowed to grow old in obscurity? or a collection of photographs for which no albums or frames are provided.

When collecting the golden-rod, for this or any other decorative purpose, one must be careful to gather it as soon as it reaches full perfection; then, if dried, head downward, in a dark place it will never shatter and will be almost as pretty as when growing; if not gathered until it begins to ripen it is worthless, as it will shatter off continually, litter the room, and soon lose its beauty.

Summer Fancies.

Surely, that fascinating,y extravagant Egyptian queen, who flavored her wine with pearls, would have shaken her ruddy gold locks in wonder and incredulity could any one have given her an inkling of the influence she was to have on the fashions of a far distant and unknown land in the far-off-year 1891! There is something almost repulsive in the jet, gilt, and silver serpents which our smart "Daughters of Eve" twine amid the blossoms on their hats and round their slender wrists, apparently finding them as attractive as did ever the Mother of all in the Garden of Eden. Somewhat analogous are the toads, modeled in hard metal, which fasten chic jackets, and the spiders scattered over stylish veils. In fact, there seems to be nothing too grotesque and "creepy" but somebody will buy and wear it.

One pretty thing, however, has the fair Egyptian —or rather Madame Bernhardt in that character— given us, and that is the Cleopatra girdle, fashioned of inch-wide black ribbon or velvet, adorned with three jet, steel, gold, silver, or bejeweled buckles—one directly in the back and one on each hip—while the belt fastens in front, beneath a long, glittering band. These are charming, and look particularly well when worn with a loose-fronted bodice.

The fashionable girl this summer is extremely long-waisted. Happy is she if Nature has so made her; but if not the dressmaker does her best to improve on Nature, and the girl herself sees to it that there are no gathers or bunchings around her waist, having all her petticoats hung on yokes. The long-seamed Louis XV coats, with perpendicular trimmings, also help to give a slender effect Sleeves continue high on the shoulder, and there is a little spring sold at city shops which holds even the thinnest material upright, so there is no danger of the puffs being depressed by damp weather or crushed beneath wrappings.

A delightful new fabric for summer wear is known as Javanese batiste. It somewhat resembles nun's veiling, but is striped with satin and powdered over with such exquisite, natural flowers it seems as though they must just have dropped from an artist's brush. The seamless bodice is a good design for making up these goods, and also for the pretty, inexpensive challies. It is plaited in front and shirred at the belt line in the back, the ends being hidden beneath the skirt. Dotted white lace and ribbon to match the figure in color form the most favored trimming, the former being set on as a flounce across the front breadth, and having ribbon run through a puff at the top and tied in a bow at each side. The same lace edges the waist, forms frills at the wrists, covers the collar, and may be arranged in a V from the shoulders to the bust. Much ribbon is also employed in the way of headings and shoulder-knots. Another pretty style shown on sample dresses is striping the skirts of light gowns with inch-wide ribbon, set a finger apart, and running from the belt to the foot. Similar bands extend down the sleeves and are arranged fancifully on the waist.

As the heat increases the size of hats does likewise, and very picturesque many of them are, with their curved brims and laden with bluets, black-eyed Susans, or morning-glories; while in some cases plumes have given place to two stiff black quills crossed and set directly on the back. Small traveling hats dispense with flowers, as a rule, and are simply trimmed with twists or flat torsades of ribbon, or else with high wired loops and bows, just as is most becoming to the wearer.

Sun umbrellas are carried with trim tailor-made suits, but to accompany more dressy gowns there are beautiful black parasols covered with net, and very gay ones of bright-hued chiffon, as well as the ever popular but generally unbecoming sunshade of red silk. Black, brown, gray, or dark blue, however, are the most serviceable colors for a parasol that must do duty on most occasions, and be sure the handle is of natural wood and not silver or gold.

In Canning Time.

In canning fruits it should be remembered that the "keeping" property lies not in the sugar used, as in preserves, but in having the jars perfectly air-tight. Indeed, in the writer's family, pieplant and apples are often put up without any sugar whatever, the sweetening being added when needed, and do most excellently for pies and tarts throughout the winter. Since, then, so much depends upon the can, a well known and tried make of glass jars should be selected, and when saved from year to year care should be taken not to mix the tops or rubber rings, for those that fit one will not always fit another.

The process here given of cooking in the jars is a great improvement on the old method of canning and will produce much finer looking fruit, while the amount of sugar required for each quart jar has been reduced, by a housewifely writer, to the convenient table given below:

For strawberries,	10 ounces.
For raspberries,	6 ounces.
For huckleberries,	6 ounces.
For cherries,	8 ounces.
For quinces,	12 ounces.
For peaches,	6 ounces.
For Bartlett pears,	8 ounces.
For pineapples,	8 ounces.
For plums,	10 ounces.
For currants,	10 ounces.
For crab-apples,	10 ounces.

Small strawberries seem to be better for canning, but all other berries should be large and firm. Cherries are canned with the pits in, as the pungent kernel adds much to the flavor. Pineapples are peeled, the "eyes" carefully picked out, and then shredded with a silver fork or else cut into small, square dice. When pears are not too large to pass through the neck of the jar they are handsomer canned whole, with some of the stems left on, but if of goodly size, pare and cut in halves, but do not remove the seeds. Peaches are usually pared, halved and pitted; but the writer has eaten very delicious small ones put up whole, with the stones left in. Quinces must be pared, quartered and cored.

When all is in readiness and the jars tested by filling with water, covering and turning upside down to see that no moisture oozes out, drop the fruit carefully into the cans, gently shaking so as to fill the interstices closely. Next find the amount of sugar required for each quart jar and use as many times this quantity as you have cans of fruit. Melt this in a saucepan over the fire, with just enough boiling water to dissolve it, and when slightly cooled divide it among the jars, a teaspoonful at a time. If there is not sufficient syrup to fill each one to the top, add lukewarm water up to the brim, and screw or "lock" on the covers rather loosely. Now have ready a spacious kettle or wash boiler, in the bottom of which has been laid a thick, soft cloth, and in this set the jars; fill with warm (not hot) water up to within an inch of the top of the cans, and place the whole on the stove to boil. Do not set directly over a very hot fire, however, or the jars may crack, and the object is to slowly *steam* the fruit. After the water bubbles allow it to boil for ten minutes, then remove the top of one can and pierce the fruit with a steel fork. If soft it is cooked sufficiently.

Ten minutes is generally long enough for berries, but pears, apples and quinces take longer, according to their solidity, and therefore the exact time must be left to the judgment of each canner. When sure that the fruit is done set the kettle to one side and, wrapping the hand in a towel, lift out the jars; remove the covers and fill with boiling water until they are overflowing, after which adjust the tops as quickly as possible, screw on securely, and invert to be sure they are perfectly air-tight. Should any juice ooze out after the can is cool the only remedy is to turn the contents into a saucepan and boil, according to the old-fashioned method; but this will rarely happen if directions are followed minutely.

Screw tops should always be fastened with a wrench. Keep in a cool, dry, dark place, and always open canned fruit a few hours before it is to be used, as the oxygen in the air restores any flavor it may have lost by being confined so long. If a jar does not open easily never ruin it by trying to pry off the top with a knife. Instead, immerse it, top downward, in water as hot as you can bear your finger in, after which the cover will generally turn readily.

Hot Weather Cookery.

It is a fact that never are soups more welcome than in summer. Not heavy meat or dried vegetable soups, but light consommes and broths made from veal, poultry and green vegetables. We have simplified one of the most delicious soups of a great artist, which, if you will not let the name frighten you, we will still call

Consomme à la Carême.—Put over the fire in your soup kettle the carcass of one or more roasted chickens, a ten cent knuckle of veal and some roast beef bones, if you have them, and cover with a quart of water for every pound of meat and bones. Let this come to a boil slowly and add the usual soup vegetables; simmer four hours and strain. This broth will be transparent, nourishing, and of a rich yellow color. Remove the fat, if any, from the top, and return it to the fire with a teacupful of carrot, turnip and leek for each three pints of the broth. The carrot and turnip should be peeled and then cut in wafer-like slices, halving and quartering the slices of turnip if large; simmer until they are tender and finish with a few spoonfuls of asparagus tips parboiled until tender in boiling water. Cut some thin slices of bread, butter them, cut in small dice and dry in the oven; put them in the tureen and pour the soup over. This is not a troublesome or expensive soup if you take the opportunity to make it when you have the materials on hand. The turnips and carrots can be those left from yesterday's dinner, as also the asparagus, in which case they will need only to be made hot in the broth.

Cucumber Soup.—This is a delightful warm weather soup. Have ready such a broth as that given above, but instead of adding turnip, carrot and leeks, add cucumbers prepared as follows: Pare two medium-sized cucumbers, remove the seeds with an apple corer and fill with chicken or veal forcemeat; place them in a saucepan with thin slices of salt pork and enough broth to cover; cook slowly for half an hour; lift them out and when partially cool cut in round slices half an inch thick; lay these in a soup tureen with some dice of dried bread and pour over the hot broth. The broth in which the cucumbers were cooked may be strained and set aside for use another day.

Gooseberry Cream.—Boil a pound of green gooseberries; drain, and when cool press through a fine sieve; sweeten to taste with white sugar and add double the quantity of sweet cream whipped stiff. Serve in little china or glass cups with sponge cake or lady fingers.

Cherry Batter Pudding.—The cherry season is a short one on this side of the Rockies. In San Francisco you may eat cherries for four months of the year and not make yourself bankrupt either. Beat three eggs, add a pint of sweet milk, half a teaspoonful of salt, a tablespoonful of melted butter and three and a half cups of flour sifted with two heaping teaspoonfuls of baking powder. Stir in one pint of stoned cherries drained from juice and dredged with flour; pour into a buttered mold, stand in a pot of boiling water and boil without ceasing for three hours.

Frozen Cherries.—Stone a quart of sour cherries, cover with one pound of sugar and let them stand for an hour or two, then stir until the sugar is dissolved, add a pint of water and freeze.

Jelly.—All small fruit jellies are difficult to make because care enough is not taken in the selection of the fruit and in expressing the juice. Let the berries be rather under- than overripe; put them in a stone jar, stand this in a larger vessel of cold water, set over the fire, and boil until the fruit is soft, keeping it covered. Squeeze out through a jelly bag, and allow a pound of sugar to each pint of juice. Heat the sugar in the oven, in earthen dishes, and boil the juice twenty minutes from the time boiling commences, add the hot sugar, and as soon as dissolved fill the jelly tumblers. The writer has never failed to have firm jelly when these directions have been carefully followed.

BOYS & GIRLS

Why The Bell Was Silent.

KATHERINE HAMILTON.

Supper was over in the college of Sainte Barbe. The lessons for the next day were all prepared, and the boys were getting ready for bed. A merry lot they were in the preparatory department this year; nearly all French of course, with here and there a little Englishman from across the Channel, and in one of the beds in the long dormitory slept a small representative of our own Republic, Frank Harrington, whose parents had left him to receive his winter's schooling at Sainte Barbe, while they were traveling abroad. Frank was a great favorite among the boys, bright, overflowing with fun, and full of American grit. They admired the little fellow's courage and daring, and that fine sense of honor which is born in the breast of every true American boy. And Frank Harrington, if the truth must be told, rather enjoyed all this admiration, and was not a little proud of being a leader among the French boys.

At the extreme end of the dormitory stood the bed of the only boy who refused to acknowledge the reign in the preparatory school of "*le petit Americain*," as Frank was called. A proud, haughty nature had Louis de Chaves, the last of a long line of titled ancestors, faithful followers of the Bourbons, and hating with an inherited hatred all that savored of republicanism. Although younger than Frank by several years, he seemed to have taken an instinctive dislike to the careless, happy-hearted boy, and more than once had succeeded in bringing him into disgrace.

It had been a holiday, and the boys had been having a very jolly time, so being unusually tired to-night they were unusually subdued and, after a whispered word or two about the games of the day, went quietly to sleep. Gradually the few noises about the college ceased, until the ticking of the clocks could be heard through all the buildings. Outside, the streets of Paris grew more and more deserted, and the lonely footsteps of the *sergeants de ville* were the only sounds which broke the stillness of the night.

Frank Harrington had played a little too hard that day, or his supper, somewhat better than usual on account of the holiday, had disagreed with him, for he was very restless, and started many times in his sleep, until at last his eyes opened wide and would not close again. It was very still. Frank was unused to being awake in the night, and it seemed to him he had never felt anything more oppressive than the silence of the room, and the regular breathing of the sleeping boys. The moon shone in full through the window just above his head, and threw long shadows over the floor, which he fancied took queer forms and shapes around him. The great hall clock struck two, and he started, so loud it sounded through the room. At last, however, he grew sleepy, and was just beginning to doze comfortably off, when he saw a small, white-robed figure coming slowly toward his bed. Now Frank had been a little nervous for some time, though he wouldn't have admitted it for the world, and his heart gave a bound, and for a moment he held his breath, then the figure stepped into the moonlight, and he saw that it was Louis de Chaves. His eyes were closed, and Frank saw instantly that he was walking in his sleep. He felt a little ashamed of his fear a moment before, especially as he had often heard the other boys say that Louis was a sleep-walker.

"It is always he," he thought, petulantly. "I would be real happy here if it wasn't for this miserable little royalist." Louis stood for a moment, as if hesitating, and then turning walked slowly along the length of the dormitory. Frank watched him curiously until he saw him reach the door, when, to his surprise, Louis opened it and passed out, closing it quietly after him. Frank's first impulse was to spring out of bed, and follow him. "He will come to some harm," he thought. "The stairs are just outside." Then came a selfish thought. "It is cold. He wouldn't do it for me." Five minutes later Frank Harrington was fast asleep.

HE CLASPED THE SLEEPING BOY

Every morning at half past five the bell of Sainte Barbe rouses the students of the college. A half an hour later it is rung for prayers. But the hands of the clock pointed to twenty-five minutes to six, and one after another the boys awakened, wondering what ailed the punctual old bell, that had never failed in its duty since their grandfathers were babies. They were not left long, however, in suspense. Through the long corridors one of the under professors noiselessly passed. With his finger on his lip commanding silence, he beckoned to the frightened boys who quickly gathered round him, and in low, hurried tones told them why the bell had not been rung. In the dim gray light of dawn, one of the professors, looking from his window, had seen little Louis de Chaves sitting on the edge of the eaves which ran along the French roof of the further building, his feet swinging over the terrible height, and his whole attitude showing him to be asleep. The windows above him were securely grated, so that the only way he could possibly have reached this position was to have climbed out of the window at which the professor was standing, walked over the roof below, and crossed a narrow ledge which ran between the two buildings. The professor stood for a moment horror-stricken, then rushed with the alarming news to the head of the college, who commanded that the bell should not be rung, and sent immediately to the nearest *mairie* for assistance, and so perfect is the police system of Paris that, by the time the boys had hurriedly pulled on their clothes and collected outside the building, beds and hay were piled on the ground, policemen were stationed at the two streets running into the Rue de Reims to prevent persons, or vehicles, from passing, and others were ranged all along the walls to maintain the perfect silence which was absolutely necessary, for every one knew that any sound awakening the little sleeper would be instantaneous death by causing him to fall from his dangerous position down the fearful number of feet which lay between him and the ground.

THREE POLICEMEN HELD THE ROPES.

The question now arose as to how the boy was to be saved. There seemed but one way; to take out the grating as quietly as possible from the the window above, and let some one down to him by a rope.

But who would undertake so hazardous a thing? All held back afraid. They knew that one false step, or the least want of steadiness would hurl the unconscious boy to the ground.

Frank Harrington, too, heard the reason told in whispered tones why the bell was silent. He stood now among the group of frightened boys, his eyes fixed in horror on the helpless figure so far above him, for he knew that he had held in his hand the night before the life of Louis de Chaves and had thrown it away as worthless.

He stood dazed and shuddering, until he heard them wondering around him who would be brave enough to try to save Louis. Then he started forward: "I will go. Oh! let me try. I am sure I can save him!" he whispered earnestly. The permission was granted, and a few minutes later all below were held spellbound as Frank appeared at the window, and cautiously began his descent toward the spot to which all eyes were lifted.

Three policemen held the rope, which was fastened just below his arms. Slowly he neared the

place, he reached it, he clasped the sleeping boy firmly around the waist. A struggle as the little fellow awoke, and then, as the two boys were carefully drawn up again, cheer upon cheer echoed up and down the street for Louis de Chaves and "*le petit Americain.*" And when, a moment later, the great bell pealed forth to summon them to prayers, all knelt with softened grateful hearts around the young royalist and the brave boy who had saved his life and gained his friendship.

Don't Play Rude Jokes.

NELLIE BURNS.

Don't like sermons, eh? I know it. Young folks never do. They think of sermons as being prosy and fault-finding. And who wants to be always hearing of their faults? Not fun-loving, mischievous boys and girls, surely. One may praise them, tell them how bright and pleasant they are, without the least danger of giving offense. But touch their faults, and see if it is not a little like throwing gunpowder into fire. But for all that, we older heads have to risk the dangers of the explosion, or rather, of giving offense, for the sake of saving our bright boys and girls from falling into rude, harmful ways.

A few years ago, when the writer was attending school, one day at recess a bright, healthy girl of thirteen was walking in the aisle of the schoolroom, when a mischievous boy, to have a little fun, thrust his foot into the aisle in front of her. The girl did not see it, tripped over it, fell headlong, striking her back on the sharp edge of a desk. Oh! what a change from that instant in that bright young life! Gone health, gone pleasure, gone all the brightness from life! Her spine received a fatal injury which made her an invalid so long as she lived. A suffering body and darkened sick-chamber were her portion in life thereafter. Ah! but at what a cost that boy secured his fun!

About four years ago, a young nephew of the writer was playing with some boys, when one of the number, in reckless sport, threw a stone with great vim into the midst of his companions. It struck my little relative's knee, and fractured the bone. From that day to this he has never walked. A helpless cripple, four years of suffering, and hundreds of dollars spent in treatment, has been the result of that one rude act.

Not long since, two boys placed some gunpowder under an old pan. Close to the powder was an apparatus (with a string attached which extended out from under the pan) for striking a match, which caused the powder to explode. The joke lay in having an innocent boy pull the string. The first boy who did so was made blind by the explosion. All through life he will grope in darkness and suffering, a victim of his playmates rude joking.

In a female boarding-school was a girl, who was very unprepossessing in person; was frail, and of a highly nervous temperament. She was so eccentric as to be disliked by the students. Her room was connected with one occupied by two thoughtless, mischievous girls. The door between the rooms was kept locked, and the key removed. But one night the two girls procured a key which unfastened the door, dressed themselves in sheets, and covered their faces with ghastly looking masks. When the lone girl was asleep, they went to her bedside and awoke her. In the dim light she saw two spectral forms standing by her bed. She gave one scream, which echoed throughout the building, then fainted away. When the preceptress and others reached her room they found only the unconscious girl, and it was only after a thorough investigation that the guilty ones were discovered. They were speedily expelled. But their victim went into a nervous fever, which lasted for many long weeks, and caused her to lose a term of school.

Now, young friends, how do you like these pictures? Do you think you would enjoy having such jokes perpetrated on you? Does there not seem something almost fiendish in a spirit that can find pleasure in what gives pain or fright to another? Would you like the thought weighing on your conscience that you had blighted the life of a playmate? Don't you know that the planning and perpetrating of such jokes stimulates a coarse, cruel spirit, which should be checked instead of encouraged? Have you ever thought that the only difference in your being liked or disliked, in having friends or being friendless, lies wholly in your actions toward others?

It is no palliation to your act to say: "I didn't mean any harm," when evil comes of your rude jokes. It doesn't lessen your victim's pain in the least. And an injury produced by the foolish sport of a friend is harder to bear than though it was inflicted by the most bitter enemy.

Our Puzzle Column.

For the five best lists of answers to the following puzzles we will give prizes as follows:

For the first best list we will give a Remington double-action Flobert rifle worth $4.00.

For the second best list, a gentleman's shaving set, worth $2.00.

For the third best list, a gold-lined, silver-plated cup worth $1.50.

For the fourth best list, a celluloid manicure set, plush case, worth $1.00.

For the fifth best list, a mineral cabinet worth 85 cents.

These prizes will be forwarded prepaid to those who send the five best lists of answers. We do *not* offer prizes for every list sent in, but only for the five best lists. Answers must be mailed on or before the 20th of this month to "Puzzle Editor," AMERICAN AGRICULTURIST, 52-54 Lafayette Place, New York.

12. NUMERICAL ENIGMA.

A well-known writer.

I found a rock upon the 8, 19, 2, 11, 12 upon which we 16, 18, 17 could 15, 5, 16, and watch a 15, 7, 14, 13, 16, 11, 1 of the 15, 9, 2, and there I told 12, 6, 3, my 15, 6, 11, 4, 10, 7.

13. ANAGRAM.

We burn Asa's lantern. (The answer is one word.)

14. PI.

Awth hought on learsul worg ish verag vaboe,
Dan roe shi mean no pultscured fasth amy sire?
Ot het twese pristi fo elsunfish vole
Saw ton shi file a soulgiro craisfeci?

15. THE SIXTEEN PUZZLE.

Arrange the first 16 numbers (from 1 to 16 inclusive) in a square of four numbers in each line, placing them so that the sum of their numbers shall be 34 when added horizontally, perpendicularly, or diagonally, from corner to corner. Of course each number is used once only.

16. LITERARY RESEARCH.

Who wrote

"Yet but three? Come one more;
Two of both kinds make up four.
Here she comes, curst and sad;
Cupid is a knavish lad,
Thus to make poor females mad.
Name the author and his work."

ANSWERS TO THE MAY CONTEST.

1.—38) 752,891 (19,812
38
—
372
342
—
308
304
—
49
38
—
111
76
—
35

2.—Advantageousness.

3.—Blue—glue, glut, slut, slat, seat, sent, pent, pint, pink.

4.—Maine—Dover, Saco; Missouri—Salem, Roland.

5.—Commonest.

THE PRIZE WINNERS.

First prize, Jere Williams, Secretary's office, U. S. Senate, Washington, D. C.

Second prize, James W. Beede, Rockford, Wright county, Minn.

Third prize, F. C. Goffe, box 218, New Rochelle, N. Y.

Fourth prize, Margaret E. Leete, Leete's Island, Ct.

Fifth prize, L. C. Streetfield, Emsdale, Ontario.

Sixth Prize, D. G. Piper, Locust Lane, Pa.

Seventh prize, Stewart Jones, Hamilton, N. Y.

Eighth prize, E. J. Hall, Lyme, Ct.

Ninth prize, Bertha Van Scoy, Candor, N. Y.

Tenth Prize, David Himrod, Sterling, Kan.

AN AGREEABLE SURPRISE.

A few days ago, I was agreeably surprised on receiving a very handsome little silver watch from you, as a prize for the second best set of answers to the December puzzles. I could not express to you in words my real thanks for the same. It is a prize indeed, and I shall always remember you in kindness for it. It seems almost an impossibility for us to get along without the AMERICAN AGRICULTURIST. Every item it contains is of importance to us in some way. We all read it with interest, and then we file the numbers away to refer to hereafter. My father used to take it years ago, and I think we have every number of the papers still, and occasionally we look them over and we always find something interesting and useful to us. I hope that success may ever follow your good efforts in every way, and that you may reap the reward of your good hereafter.

VENIA M. POTTER, Kingwood, W. Va.

Odds and Ends from the Patent Office.

E. A. MATTHEWS.

Almost every article of human convenience or necessity in market to-day has been affected more or less by the laws of the patent office, and yields a profit to its fortunate inventor. "If we buy a box of paper collars a few cents of the purchase money goes to the inventor; if we buy a sewing machine we probably divide the money between ten or a dozen persons who have, one and all, retained a right to a share."

Many large fortunes have been made by the accidental discovery of some trifle that was found to supply a long-felt want, and monuments have been erected in honor of men who were benefactors without at all intending to be.

In our civil war was a colonel who shared the fortunes of his men and often suffered for want of food and water. Many a plan for obtaining the latter was tried and abandoned in despair, when one day he conceived the idea of driving a two-inch tube into the earth until water was reached, and then attaching a pump, and lo! the problem was solved. So simple was it, and yet so sure, that the wonder was it had not been found out long before; and all over the country the inventor of the tube-well was held in grateful remembrance.

Among the large fortunes made from the invention of small things may be mentioned that from the "stylographic pen," and a pen for shading in various colors, which yields its owner four thousand pounds per annum. A large profit has been reaped by the miner who invented a metal rivet or eyelet at each end of the mouth of coat and trousers pocket to resist the strain caused by carrying bits of ore and heavy tools. The man who happened to think of small metal plates to protect the soles and heels of boots made his fortune at one stroke, for it is said that in the first year of their manufacture there were sold over twelve millions, and in less than ten years his profits were over a million dollars. The discovery of perforated material for bottoming chairs has made a million of money for the lucky patentee. After many years experience he hit upon this plan, which consists of gluing thin layers of wood together, so that they shall be both strong and pliable. He formed a company, and to-day is in receipt of a princely income from his invention.

One of the largest sums ever obtained for any small invention was for the inverted glass bell to hang over gas jets so as to protect the ceilings, and the gimlet pointed screw has produced more wealth to its owner than most silver mines. The American who conceived the odd notion of putting copper tips to the toes of children's shoes is as rich as if he were a member of the royal family, and his income is double that of the President of the United States. The genius who gave roller skates to the young people was well rewarded for his work, although his patent had nearly expired before they became "the rage." A very useful, though small, "notion" is the darning weaver, which repairs stockings, undergarments, etc., and the profits from its sale already wonderfully large are constantly increasing.

Every one has heard of the great fortunes made by the inventors of the sewing machine. The central idea of this great invention was the eye in the point of the needle; and with that for a starting point, additions have been made until every separate portion of the complicated affair has a special patent. The telephone, the planing machine and the rubber patents have realized many millions each, and the simple idea of heating the blast in iron smelting increased the wealth of the

country by hundreds of millions. An enormous fortune grew out of an accidental discovery that if candles were molded in a socket with tapering ends they could be more easily removed, and a simple contrivance for threading needles brought its author an income of several thousand dollars. All Western people, as well as others, are proud of the great McCormick fortune, which came from the invention of the reaper; and has been a blessing to hundreds outside the narrow circle of its natural inheritors. Every trade, employment or profession has felt the aid of various articles patented for its exclusive use. Agriculture, in particular, is not at all what it was even fifty years ago, and the farmers have been lifted up by the numerous riding plows, steam thrashers, reapers and other helps, so that one man can now do the work of six and with less fatigue. Our kitchens have become absolute museums of ingenious patented contrivances, and even dishwashing, the most monotonous of all work, has become a regular triumph of skill, by means of a woman's bright invention.

"THE FOUR CHILDREN STARTED HOMEWARD TOGETHER."

Blackberrying.

A. M. GEORGE.

The clock above the teacher's chair in the little red schoolhouse was near the stroke of four. Many eager glances were directed to the slowly-moving hands for it was Friday afternoon, and four o'clock was the signal for two whole days of freedom. Only the smaller children of the district were in school, all the large boys and girls being kept busy with the summer work of the farm. At length the "first class" in spelling had spelled or missed its last hard word; the books were put away as the clock struck four, the schoolma'am declared "school's dismissed" and there was a joyful rush out of doors.

The jolliest boy in school was Walter Fennel. He was just full of fun and mischief. If there was anything in the world that he liked better than fun, it was his little five-years-old sister Martha. It was her first summer in school, and many were the tears she shed during the first few days of the term when she had to sit with other little girls and away from Walter. But she soon became used to it, only she was always glad to meet him at the door as soon as school was out and trudge home by his side.

The new scholars in the school this summer were Robbie and Maggie Leslie, who lived in the tenant-house on the farm of Walter's father. Their father, who had come lately from Scotland with his wife and "bonnie bairns," had hired out to work on the farm. Robbie and Maggie were quite unused to the ways of American children, and their odd ideas of things and broad speech made much fun for the other boys and girls. But Walter, with all his love of fun had a kind heart, and stood up stoutly for the newcomers, though he could not help laughing as long and loud as anybody at what were regarded as their odd ways and speeches.

When the school was out on this Friday afternoon the four children started homeward together, pausing on the way to listen to the shrill note of a harvest fly, or shy a stone at a squirrel which scampered along the rail fence ahead of them. On the way home it was agreed that they should all go to the "Slide" the next day and pick blackberries. The only doubts they had about it were about whether Martha's mother would let her go. "She's sic a wee thing," was Robbie's way of putting it.

But when morning came, Walter's pleadings and Martha's tears prevailed at length over mother's fears, especially as Martha was a sturdy child, who had always been allowed plenty of outdoor life. Immediately after breakfast Mr. Leslie was at the gate of the farmhouse with his two children in the great lumber wagon drawn by a span of horses. Walter and Martha were lifted in and the horses started off at a brisk pace. In less than half an hour they arrived at the bars of the lane which led to the Slide. There they halted. Mr. Leslie lifted the four children from the wagon then turned the horses' heads and drove back, having promised to return at noon and take the children home.

The Slide was what Robbie called "an uncanny spot." It lay on the bank of a creek, and was some twenty feet lower than the adjoining field. It was once on the same level, but years before the water had washed away the earth under the thin layer of slate rock which underlaid the region, and one April night after a long and heavy rain the farmers who lived near were startled by a mysterious roaring and crashing. When morning came they found that there had been a landslide, and that more than twenty acres lying next to the creek had subsided. Great trees were overturned and the whole mass was a wild scene of ruin. But year by year the rain and frosts leveled off the hummocks, and blackberry bushes came in and took almost complete possession. A safe and easy pathway led down from the meadow to the Slide. To all but Walter it was a new Wonderland. The squirrels ran up the trees and sat barking at them; the birds flitted silently through the leafy shadows; the harvest flies shrilled their strident notes; and what was of more interest to the children the blackberries hung in honey-sweet clusters on all sides. Before noon they had filled their pails, eaten all they could hold, stained their faces and torn their clothes; and, as Walter afterward told his mother, had "lots of fun." Then they climbed up the path pausing near the top to drink from a spring which gushed out from the bank. As they started through the lane to the road, Robbie called out suddenly, "Haut! it's a muckle squirrel!" and picking up a stone, "Hold on," called Walter. "Don't throw anything nor go any farther," laughing so hard he could scarcely speak. They had not long to wait at the bars before they heard the rumble of a wagon coming toward them and it soon came in sight around the hill. Mr. Fennel held the reins, and as he drew up near the children Walter laughed out "Papa, we saw a skunk running across the lane, and Robbie most hit it with a stone."

Kind Words.

Cannot Farm Without It.—To make sure not to miss the AMERICAN AGRICULTURIST, I renew for two years. I cannot farm without it.

D. S. WHITNEY, Broome Co., N. Y.

Thinks Everything of It.—We think everything of the AMERICAN AGRICULTURIST, and cannot get along without it.

GEORGE O. GRIDLEY, Kankakee Co., Ill.

The Great Salt Lake.

Driven from the Central States the Mormons went far out into the deserts of the West, where they hoped to be free for all time to enjoy their peculiar belief. Civilization long ago caught up with them, and such has been the marvelous development of the far West that they are surrounded by Gentiles. Even in their great stronghold, Salt Lake City, Mormons seem to be in the minority.

One would scarcely have believed that the region which these people first saw could ever be made to be other than a great barren desert. Upon the borders of the shallow lake of briny water they began their town, which has become the wonder of the West. Great stretches of alkaline mud flats and salt marshes bordered the lake, and these merged into barren plains, covered only with sparse desert grass and sage brush. The hot winds drove storms of dust before them; rain rarely fell; and the parched country seemed wholly incapable of yielding the crops which the immigrants determined to force from it. The lack of rain was supplied by water led artificially from mountain streams. Not only were crops raised, but a veritable oasis was created in the desert. After journeying across the heated plains the traveler feels a sense of the greatest pleasure and relief when he finds himself in the broad streets of Salt Lake City among the avenues of trees and gardens. It is a strange contrast from absolute desert to blooming gardens.

The conditions by which the Great Salt Lake of Utah has come to its present state are interesting. The visitor to Salt Lake City may see in the distance along the mountain base long terraces, one above another, flat-topped and continuous, except where cut by the small gullies formed by the freshets of the rainy season. These are the successive shore lines and beaches of a greater lake—the ancestor of Great Salt Lake—which once covered an area of 19,750 square miles, and attained a depth of 1,000 feet in some places. If the lake could again be made to fill its old basin the Mormon temple at Salt Lake City would stand in 850 feet of water, more than one hundred towns and villages would be submerged and 120,000 people would be driven from their homes. The ancient lake has been called Bonneville, after an army officer of that name who was the discoverer of the Great Salt Lake in the early part of this century and whose notes were published by Washington Irving in 1833.

In the Far West, between the Sierra and Rocky Mountains is a great region without drainage to the sea, and called for this reason the Great Basin. The greater part of Utah and Nevada, as well as some of the adjoining territory, is included in this basin. The reason why it does not drain into the sea is that the rainfall is too slight to fill the basin to overflowing, but it has not always been so. When the climate of Northern America changed from warm to cold at the beginning of the glacial period snow began to accumulate, and this in time formed a great ice cap over the northern and northeastern parts of the continent, and glaciers like those of the Alps to-day existed in the Rocky and Sierra Nevada Mountains. The reason for this change is not fully known, but the fact of the change is well proved. During this time a colder and moister climate existed in the region of the Great Basin, and it was then that Lake Bonneville filled all the region of the Great Salt Lake Desert and overflowed through a broad channel into the Snake, thence into the Columbia river, and finally to the Pacific ocean. The country thereabouts must then have been a beautiful one. An evergreen vegetation then clothed the mountain slopes, now so sere and barren, and valley glaciers descended nearly to the water's edge. The fine mountain scenery and the great inland sea could not have been surpassed for beauty and grandeur in all the world. Even volcanoes existed in the great lake, so that all the grand sights of nature were then exhibited there.

Gradually the climate changed, the lake retreated, and finally only the shrunken remnants of the present time remained. It was a great desert basin at first; was then filled with water until it overflowed, and is now in its old condition again; but the lake sediments, forming all the agricultural lands of the region, were left behind, proving of value not only to the farmer but also to the geologist who studies the history of its changes. Water passing over the rocks dissolves from them many minerals, among others salt. When water evaporates only pure vapor passes off and the mineral substances are left behind. In desert regions evaporation is more complete than in moist regions, and all the water that falls, except a very small residue, is evaporated. Then very quickly the shallow bodies of water in such places become intensely salt and soon they are so salt that no more will remain in solution and some has to be deposited. This is about the condition of the Dead Sea of Asia Minor.

When we see the evidence of such vast changes we cannot help standing aghast. A century is but an instant in the life of the earth, and human experience gives us no clue to the stupendous changes of the past, because it is too brief. The indisputable records of the rocks are our only guide. Continents have been formed and changed; mountains have grown and been worn away; climates have varied, from dry to moist, from warm to cold, and all these changes have been caused by slow processes acting just as they do at present. RALPH S. TARR, Salt Lake City, Utah.

The California Orchards and Vineyards.

The agricultural prospects of California were never better. A larger acreage of cereals has been sown, and the extensive planting of vines and trees has entirely exhausted the stock of the nurseries. Only one department of horticulture remains quiet. There is an almost complete cessation in the planting of wine grapes, for profits have not been large for several years, many unforeseen difficulties have been met with in the manufacture and the marketing of pure wines, and valuable vineyards can often be purchased for much less than they have cost to bring to their present state of fruitfulness. Table grapes are planted more than wine grapes. The mountain sides are the only places for growing the higher types of table grapes, the reddest Tokays, the sweetest Muscatels. Santa Cruz, Santa Clara, Contra Costa, Solano, the Sierra foothills, all have large table grape interests. The Red Cornichon is a grape of comparatively recent introduction, but it promises to do particularly well. The common Cornichon, the Emperor, the Black Morocco and the Black Hamburgh are among the kinds shipped, but Flame Tokay and Muscat of Alexandria comprise the bulk of the supply.

The raisin grape industry, unlike the wine and table grape departments, is extending with marvelous rapidity. Thousand-acre vineyards are being planted. Capitalists are buying tracts and hastening with speed to plant them to raisin grapes. Colonies in which the small savings of teachers and clerks can be put into raisin grapes are established every day in the year. Inventors are cheapening and shortening the process of curing the grapes, and, to sum up the whole matter, entire districts appear to be given over to this highly specialized occupation of raisin making. Returns are so rapid, profits so large that one cannot feel surprised at the interest shown in this industry. But there is danger that vineyards may be planted on unsuitable soils, and hence prove unprofitable. The danger of overproduction is also a real one, though it will not be likely to trouble the growers for a decade to come. A more serious problem is that of the labor supply, and this will probably pinch the planters severely long before the close of the century.

It is common to think of Northern and Central California as "the home of the deciduous fruits," but the experience of the past few years shows that large districts in the extreme Southern counties, clear to the Mexican line, are well adapted to these fruits. One can fairly say that the remark of the old pioneer, that California had samples of all the climates of the rest of the world besides a number of special and private kinds, is literally and completely true. The mountains of San Diego contain large and profitable peach, apricot and prune orchards; far up the slopes of the San Bernardinos are orchards of winter apples and pears; the cherry is an entire success in many Southern California colonies. Nevertheless, the great commercial orchards of deciduous fruits are north of the Tehechepe Pass—and probably the bulk of these fruits will always be grown in Northern and Central California.

The peach is everywhere a royal fruit, leading in importance all other deciduous species. The prune, in many varieties, probably comes next, because of its great sale in the dried form, though one hesitates, somewhat doubtful as to whether the apricot does not lead the prune. Below both these, but still of much importance, is the pear, and then come apples, nectarines, Japan persimmons, and some other fruits for which the demand is as yet small. Apples are only grown for the home market, and do not rank as a prominent commercial product. Still, there are immense tracts of uplands that will some day be planted to this fruit, and their product will drive out the insipid valley apples, and may even reach the Chicago and New York consumers. Speaking in broad terms, the land of the old mining camps produces as highly-colored and richly-flavored apples as any in the world.

A large future is confidently predicted for the fig. The past year has helped to define the limitations of fig culture, and much has been done in nomenclature. California is making ready to supply the entire demand of the United States for dried figs, and, with better transportation and cold-storage facilities, may yet ship fresh figs to Eastern cities. In the fig orchards of the State are some of the finest horticultural possibilities of the near future. C. HOWARD, Alameda Co., Cal.

The Range Industry in Utah.

Few persons who read of the gradual failure of the so-called "range industry" have the faintest idea of what it has come to mean for the agricultural settler. I do not believe that all of the men who have capital invested in stock companies are aware of the details of the business. In the old pioneer days young men took a few cattle out into new regions and gradually grew rich through the free pasture and the increase of their stock. The syndicate system has stopped all that. A new county, in advance of settlement, is stocked with cattle by rich men and held, as the old barons held their castles, by force and fraud. Ruffians are hired to intimidate small owners of herds or lonely settlers. Complaisant officials are found who ignore any law not favorable to stockmen, but who hound down any one suspected of liking fresh beef too well. A system of petty persecution is practiced against settlers, the full particulars of which would take volumes to describe. In the meantime, perhaps, the whole cattle outfit does not own nor wish to own a single foot of ground. More frequently it has a ranch from which it devastates the country.

Here in Southern Utah the riders are not personally as vicious as those in many other places. Yet the details of the cold-blooded injuries inflicted on struggling settlers by the "range industry" would make any farmer's blood boil. There are many books to tell of the ill deeds of the Mormons, but the Mormons of this region have never done us the harm that the cattle owners have done. Nor would I venture, even now, to publish the truth if it were not for a strong probability that they can no longer hold back the tide of settlers coming into the valleys of the La Sal, attracted by the mildest winters to be found in the Rocky Mountain region.

MARION MUIR RICHARDSON, Emery Co., Utah.

Bright Prospects for South Dakota.

Many farmers here are going into the sheep industry, but it is advisable to go slow at present high prices for sheep, as there may be a decline in prices, as has been the case with cattle. Last month I drove through Brown and this county and never saw grain looking better. There has been plenty of moisture, and we have every assurance of a bountiful harvest. Many artesian wells are being sunk, and irrigation tried on quite an extensive scale. Our artesian basin contains an inexhaustible supply of water, and the highest pressure of water obtained is 160 pounds to the square inch at Aberdeen, thus giving us untold motive power for manufacturing purposes.

GEORGE HICKMAN, McPherson Co., S. D.

A New Fruit Region.

The Pecos valley is thirty to forty miles wide, 300 miles long, and as level as a floor. The Pecos river, which flows through the valley, carries a bounteous supply of water, and is fed by hundreds of living springs from its source to its mouth. An

extensive system of irrigating canals is now in course of building, 120 miles of which are already completed. Over 400,000 acres of rich lands have been reclaimed by these canals, at least twenty per cent of which are still in the hands of the government, subject to entry under the homestead laws. A railway has lately been built into the valley, so that farmers now have a direct outlet for their products. We have the same climatic and soil conditions as exist in Southern California; and, being 1000 miles nearer to the Eastern markets, this valley is destined to become, in the near future, one of the richest fruit sections in the country.

G. O. SHIELDS, Pecos Valley, New Mexico.

Home Life of Northwestern Indians.

The domestic life of the Indian is not like ours. The marriage relation is different. The wives are usually taken while very young, and the father is paid for his daughter in ponies or other valuables. An Indian may have several wives if he can afford to buy and maintain them. But he is not always the hard master he is represented. That he is a loving parent there can be no doubt. More than once I have been into Indian camps in various parts of Montana and observed the camp life. The illustration, from a photograph of a group of Crow Indians, gives a vivid idea of one phase. At sundown, just outside the tepee facing the setting sun, would sit the father with a child on each knee and sometimes one on his foot, dandling them all at once, singing to the little tots and patting their backs; near by the squaw or squaws would be gathering sage brush for fuel and preparing the evening meal. Songs and laughter rang out on all sides and the dusky youths ran races and wrestled here; while there, others mounted their cayuses, rounded up the herds of ponies and brought them to the stream to drink, and then drove them at a rapid gallop back to the hills to feed for the night. By and by twilight enshrouded the scene. The campfires brightened as the families sat about them, smoking and chatting. Songs occasionally floated across the valley and the tom-tom kept accompaniment. As darkness gathered all became still; the fires died out; these simple folk had gone to bed. It has frequently afforded me pleasure to see an Indian bring his squaw to the trader's store to buy bright prints to make her dresses, and red flannel and yellow ribbons for her raven locks. He wouldn't forget a bottle of cheap-scented hair oil, such as is kept at these places. He and the squaw would smell the different perfumes and finally he would select the one she liked and buy it, remarking: "Me squaw put 'em on hair; make smell 'em heap good." Then the two would laugh gleefully and jog off to camp with their little purchases laughing and chatting away like two careless children. The Indian is not the wild beast he is made out as being. Enlist them in the army. Make soldiers of the lads and men, and give them as part of their discipline a practical education in the English language and compel every boy to learn some useful trade. Gradually weaken the tribal relations by these means. Give each one a piece of land, let him feel that it is his own, and teach him to till it so that it will yield him the best results from his labor, and in due time the Indians will become useful and honorable citizens, proud to be under the United States flag. The great crime that we and our forefathers have perpetrated against these much-abused fellow-beings will thus be, as far as is now possible, atoned for.

F. W. ANDERSON, Cascade Co., Montana.

CROW INDIANS AND THEIR CAYUSES.

Fruit Culture in South Africa.

The fruits of the Cape Colony bear a remarkable similarity with those of California, but Natal ranks preëminently as the great fruit center of Southern Africa. Its coast lands produce pineapples, bananas, oranges, mangels, papaws, grenadillas, and all the fruits of tropical climates in wasteful abundance. The banana is frequently planted in alternate rows with the coffee trees in a plantation for the shade and protection it affords the young trees. I have bought pineapples in the market at Durban for eight cents per dozen, and traveling on the coast lands we have had all the fruit we wanted given to us for the mere trouble of gathering it. From thirty to forty miles inland from the coast belt the fruits most abundantly grown are the peach and apple, while all the choicest and most valued fruits of Europe are acclimatized and yield in lavish abundance for a minimum of labor. The Concord grape of America has naturalized itself, too, in this soil and threatens almost to become a pest.

Of late years some attempts have been made to preserve some of the fruits, but they are in no way commensurate with the opportunities which this branch of industry offers. The Boers of the Transvaal attempt some little economy of their fruit, and among them it is one of the domestic arts of women to dry it—this they do in considerable quantities by a tedious sun drying process. The fruit is first of all peeled before it is overripe and cut into sections, then it is laid out on planks. It is brought indoors before sundown, the night dew or dampness causing it to spoil. Some of this fruit they also prepare by mashing it to a paste and then spread it out in thin square sheets to dry. They also peel their peaches and cut them into long strips, and these are afterward plaited into long coils which are again rolled round and round until they form an oblong cylindrical shaped coil. This fruit is disposed of to traders in barter, and the rest is used in their own homes for winter consumption.

The apathy which is somewhat characteristic in South Africa is blamed for the lack of utility to which the lavish production of earth's fruits are put, but it must be admitted that the scarcity of markets and the difficulties which exist in the way of reaching them are fatal impediments in the way of making these resources profitable, and the result is that in the market there is often either an entire dearth, or an abundance for which there is no demand. Thus, if five or six farmers should simultaneously be seized with the idea of taking a load of fruit to market, the last comers would probably have either to give or throw their cargoes away. The speed of locomotion has recently been much increased between England and South Africa, and this has induced the experiment of shipping some Cape fruits. The season for ripening in South Africa is from December to February, and thus at the season of the year at which a considerable variety of fruits could be supplied to the English market is just the period of its greatest scarcity, and hence, the prospect of such a trade is invested with the most favorable considerations.

ANNIE RUSSELL, Natal, South Africa.

Washington Wheat and Potatoes.

This is a remarkable country for grain and vegetables. I have seen wheat sown in June yield fifty bushels per acre, and have seen from twenty to forty bushels of wheat per acre where the crop had had but one rain on it since it was sowed. We paralyzed all of the transportation companies last fall, having had such great quantities of wheat and barley. All the elevators and warehouses were crammed full, and great piles stacked up in sacks on the outside. We literally blockaded the whole business, and it is said that it will take until the next harvest to get the grain to tide water, in order to have the warehouses for the next crop. We are compelled here to make a specialty of grain-raising as that is the only product that is shipped, and of course, the only one that will bring in any money. Transportation is and has been so high as to completely shut off shipments of all other products, which could be made profitable were the freights as correspondingly low as they are in other sections of the United States. We raise the finest potatoes in the world, never yet having had any disease or insects to trouble them. This State might aptly be termed a "Paddy's paradise," as all that is required on new land is to plow the seed in and let it alone until digging time when one can harvest the crop; and "such potatoes" is what every one says. Other vegetables do finely and would be raised more extensively were it not for the fact that the farmers have not the time to give them from their other work, and we have not much of a home market. All kinds of hardy fruits, apples, pears, plums, cherries, and the smaller fruits do splendidly. Apricots, peaches, and grapes are raised on Snake river, twenty miles distant, but the land requires to be irrigated there, while out here on the upland prairies we know nothing of irrigation.

E. S. BIGELOW, Colfax Co., Washington.

The AMERICAN AGRICULTURIST has done more real good than any other magazine that has ever been published. May success and prosperity ever follow your every effort for good.

VENIA M. PATTER, Preston Co., W. Va.

Good Words From New Mexico.—While I am a railroad man, I take great pleasure in reading the AMERICAN AGRICULTURIST. Its teachings are highly appreciated in New Mexico.

FRANK C. ALLEN, San Miguel Co., New Mexico.

The Best Agricultural Journal.—Success to you in publishing the best Agricultural Journal in the world. J. J. DAVANANY, Hopkins Co. Texas.

FARMING IN FOREIGN LANDS.

The frosts in France this spring ruined 5,000,000 acres of crops, and caused a loss estimated at nearly $20,000,000.

The codlin moth is said to have taken to attacking plums in Tasmania. "Sydney lates" is the variety attacked.

It is reported from Vienna that Baron Hirsch has bought land in the Argentine republic on which he intends to settle 400,000 expatriated Jews.

The Indian Empire, according to the recent census returns, has a population of 285,000,000, an increase of fully 30,000,000 since the last census, taken in 1881.

A swamp containing three-quarters of a million acres, reclaimed at a cost of $100,000,000, near the city of Buda-Pesth, has been inundated, and the crops destroyed.

The fifteenth and latest volume of the British Polled herd book contains the pedigrees of 2,458 Aberdeen-Angus cattle, being 412 more than in the last preceding volume.

The Victoria government, Australia, has prohibited the destruction of the Australian bustard, or wild turkey, on the ground of its usefulness as a destroyer of insects, particularly locusts.

A New Zealand rabbiter, on the Clifton & Carterhope estates, killed single-handed this season about 14,000 rabbits. Altogether about 70,000 of the pest have been destroyed on these estates.

The manufacture of cotton goods in Ceylon has for the last few years made remarkable progress. The island promises to become as dangerous a rival to India as in the cultivation of tea.

The export of butter from Denmark during last year shows again a large increase compared with that of the previous year, the figures being respectively 89,200,000 pounds and 68,800,000 pounds.

At the Dunlop station in the Bourke district, New Zealand, 200,000 sheep were shorn this season. James Blackley sheared 212 sheep during a working day of eight hours, breaking all prior records.

There are 444,503 horses, 1,892,963 cattle, and 55,477,404 sheep in New South Wales, Australia. The last lambing averaged 74¾ per cent, and the wool clip five pounds. Nine and a quarter ounces per sheep was thus the average fleece.

Brazil is determined to have a flourishing sugar industry. A law has been passed granting six per cent interest for twenty-five years on capital invested ($5,000,000) in creating several central sugar factories.

Judging from the local official paper, last year has seen a marked increase in the tobacco industry in British North Borneo, the output for the period being nearly 10,000 piculs, or about a million and a half pounds.

Natal's finances are not in a flourishing condition. From her latest returns it appears that in six months there was a falling off in revenue of $500,000. Whether there was a saving in expenditure was not shown.

The highest price ever realized for a yearling thoroughbred in the Australian colonies was obtained at a recent sale of blood stock in New Zealand, when Mr. Gollan gave $10,600 for a colt named Nordenfeldt.

There is only one woolen mill in Greece. It is now being considerably enlarged, and the government has placed orders with the proprietors for cloth required for uniforms, which has hitherto been purchased in England.

The splendid season in South Africa is putting new heart into the colonists, especially in those engaged in sheep husbandry, who have had two heavy lambing seasons in succession, resulting in the splendid increase of 10,000,000 sheep.

The value of coffee exported from Brazil in 1890 was from fifteen to thirty-five per cent higher than in 1889. Although the shipments were not large—2,652,373 bags in all—yet it is estimated that they brought into the country nearly $66,500,000.

It is stated by the French Minister of Agriculture that foot-and-mouth disease still prevails extensively in Switzerland, Austria-Hungary, and nearly all of the principal divisions of Germany, while it exists in a diminished extent in Belgium also.

In 1880 Australia sent 400 carcasses of frozen mutton to England. New Zealand, River Plate, and Falkland Islands sent none. In 1890 there were 3,104,590 carcasses of frozen mutton imported, of which 1,562,647 went from New Zealand and 210,631 from Australia.

The new flour mills of the Wholesale Coöperative Society, at Dunston, near Newcastle, England, have just been opened. The mills were erected by the society's own workmen, at a cost of $450,000. The mills are expected to turn out 5600 sacks of flour per week.

The imports of fat cattle from Schleswig-Holstein into the Central cattle market, of Berlin, Germany, have considerably increased within the last year. In the period from July 1 to December 3, 1890, there were 6083 head of horned cattle brought in.

The latest official estimate from Java of the government coffee crop is 305,000 piculs, while the estimated yield from the private estates is put down at 360,000 piculs, or in all say a little over 43,000 tons. Macassar is expected to give nearly 6000 tons, and Padang over 4000 tons.

Since 1878 the Australasian colonies have expended the almost incredible sum of $13,461,670 on "assisted immigration." Of this vast sum Australia proper has expended $11,881,670, New Zealand $1,390,000, and Tasmania $190,000, or a total for the last two of $1,580,000.

Next year will complete the first century of wool growing in Australia, and in that time the export of wool has reached, from the smallest beginning, the enormous total of 1,200,000 bales, and is still increasing. Its money value is estimated at $53,928,500, or $47.50 per head of the population.

Germany is said to have close on 1400 creameries. The establishments are worked on the most approved systems, superior in many respects to those of other continental countries. The German Dairy Association now offers a reward of $1000 for the best method of rapidly determining the butter value of milk.

Liberian coffee in the neighborhood of Columbo, Ceylon, is all out in splendid blossom, the beauty and fragrance of which are very attractive to bipeds as well as bees. Many of the trees are at the same time laden with fruit in all stages, from green to dark purple, as well as with the snow-white blossoms.

Owing to the almost entire destruction of perch in the river Thames, England, by a mysterious disease, the Thames Angling Preservation Society has decided to purchase 20,000 ova, which will be placed in the society's rearing stream at Sunbury, and if successfully developed will be used for re-stocking the river.

To the government of Saxony belongs the credit of being the first to impose a tax on cats. Since the 1st of January each cat kept costs its keeper a tax of thirty-six cents. A dollar a head would not be too much to impose in American cities, and would be conducive to undisturbed nightly slumbers of the inhabitants.

At the present moment the most valuable staple product of Brazil lies between coffee and sugar. During the past few months important concessions have been granted to companies for the acquirement of coffee plantations, and in other ways the government has endeavored to facilitate a natural expansion of the industry.

The hardy, useful little Kerry cattle are growing in favor in other places besides their native Ireland. Shipments are reported to Gibraltar and South Africa, to say nothing of the increasing call from England. The Dexter Kerry is in more favor than the original type in England, but the latter is the kind exported to more remote parts.

The tenantry on the estate of Col. White, at Drumcallagher, County Limerick, Ireland, have negotiated for the purchase of their holdings at the rate of sixteen years rental on the Poor Law Valuation. Nine or ten tenants have been evicted during the past few years, and a proviso has been made for their reinstatement on the same terms.

The war in Chili has materially interfered with the shipment of nitrate, and it will be some time before the work can be resumed on its former scale. The total exports for the first quarter of the year are estimated at under 95,000 tons, as compared with 199,000 tons in the first three months of 1890, and 216,000 tons in the corresponding quarter of 1889.

The houses of London, Eng., are calculated to be worth $1,060,000,000. The land on which they are built is calculated to be worth $2,090,000,000. Upon the last sum the landlords of London receive about $85,000,000 every year in rent and, sooner or later, under the operation of the leasehold system, the house property of the above enormous value will fall into their hands.

The export grain trade of Russia is very large and brings in a mint of money to the Russian farmers. For the month of April only the trade with the United Kingdom of Great Britain was twenty-three and half million pounds of wheat, sixty-nine million of corn, thirty million of barley, four and a quarter million of peas, and eighty-nine and a quarter million of oats.

The Scotch Justiciary Appeal Court, at Edinburgh, has affirmed the decision of a lower court to the effect that dehorning cattle by sawing off the horns close to the head was not illegal. It was decided that the operation, when skillfully performed, for the legitimate purpose of preventing cattle from injuring one another was not prohibited by the statute for the prevention of cruelty to animals.

Many of the barbarous natives of Africa make cigars, if such a word can be applied to tobacco roughly rolled up in a leaf. Of course the product would find no place in a European market. One tribe mixes with the tobacco thirty per cent of "Ilamba," a species of Indian hemp, the effect of which is terrible, eventually causing death, and upward to insanity, convulsions, and other minor evils, among the smokers.

Prof. Brown, principal of the Longerenour Agricultural College, Victoria, Australia, in his annual report states that the practical work of the college has been done by the students themselves, four of whom did the loading of 305 acres of grain and hay, while others did most of the planting of forty-five acres of fruit and forest trees, and neither dairymaid nor dairyman was employed about the place. Sheep shearing was also carried on by the students during the season.

About two thousand horses are imported annually into Calcutta, India, from Australia and New Zealand. The market is constantly overstocked and they sell at about one hundred and twenty dollars apiece. The government uses between six hundred and seven hundred a year and pays about two hundred and twenty dollars apiece for such as are suited to its demands. The government wants a horse fit for the artillery but most of those imported are plain head, long-legged, slow but strong animals.

The Queensland (Australia) Farmers and Graziers' Alliance has recently been organized. The Alliance proposes to furnish the Australian Department of Agriculture with reliable farm statistics and information of diseases or pests affecting animals and plants; to labor for the education of the agricultural classes in the principles of agriculture, in the science of political economy and government in a strictly non-partisan spirit and to develop for them a better state, mentally, morally, socially, and financially; to obtain for the farming classes a fair and just remuneration for their labor; and to unite the farming classes for common purposes, to suppress local jealousies and unhealthy rivalries, etc. The "Specific Objects" of the Alliance are: The formation of agricultural colleges and experiment stations; the establishment of public markets, of co-operative butter, cheese, and fruit-preserving factories, and of irrigation trusts, and the introduction of an agricultural drainage act. It is evident that Queensland is imbued with the progressive spirit of the times.

The milking machine invented and patented by William Murchland, of Scotland, has been subjected to repeated, practical trials, and gives promise of being a good thing. The principle on which the machine works is to form a vacuum around the teats of the cow, and the compression of the air upon the udder forces the milk out in a steady stream. A set of pipes runs along above the cows, and to these are connected rubber tubes which connect with a pail. The pail is covered and is connected with four teat cups, one of which is put on each teat. The air is exhausted by means of a small air pump, and the milk now begins to flow in four tiny streams. The pressure is not so strong as to injure the teat in the least, and when the milk is all out no harm is done if the holder is allowed to remain on the teat. It takes from eight to ten minutes to milk a cow, and they seem to take kindly to the machine and give their milk down very soon, and even at the first milking. It will do to use in large dairies only, and will probably cost about five dollars per cow. The machine will soon be introduced into this country.

SCIENCE IN FARMING.

The President of the Society for the Promotion of Agricultural Science.

Charles E. Bessey, born in Milton, Ohio, May 21, 1845, is of French and German ancestry, his paternal great-grandfather, Bessé, having emigrated from France about the middle of the last century. His father was a man of a fine classical and mathematical education, who for many years followed the profession of a teacher, and his mother, an Ellenberger, was remarkable for mental and moral strength. Dr. Bessey's early life was spent upon his father's farm in Northern Ohio, and his youthful education was obtained under men of more than the usual training of the country schoolmaster of the middle of the century. After receiving some preparation for college in the Canaan and Seville academies, he engaged for a time in surveying in the forests of Michigan. He received a scientific education in the State Agricultural College of Michigan, graduating in 1869, and his botanical studies were continued in Harvard University, under Dr. Asa Gray. At the age of twenty-four he was appointed to the chair of Botany and Horticulture in the then recently organized Iowa Agricultural College. After four years the chair was divided, and from this time Prof. Bessey devoted his energies to Botany and Economic Entomology. At the close of fifteen years of service, during a portion of which time he was vice-president and acting president, he resigned to accept the chair of Botany and Horticulture in the University of Nebraska. During the last three of the seven years, in addition to previous duties, he has been acting Chancellor, in which position he brought about a cordial feeling between the people of the State and the University. He has been a prominent member of the State agricultural and horticultural societies. He was one of the first members of the Society for the Promotion of Agricultural Science, of which organization he is now the president. He is a member of various scientific societies, in whose meetings he takes an active part. For more than twenty years he has been a frequent contributor to the agricultural press, and during the past few years has written mainly upon the grasses and other forage plants of the West. He is one of the associate editors of the *American Naturalist*. His leading writings are a "Botany for High Schools and Colleges," and "The Essentials of Botany," both standard educational works, largely used in the schools. The degree of Doctor of Philosophy was awarded him by the University of Iowa in 1879. Dr. Bessey's work for American agriculture is twofold. He has been a teacher for twenty-two years in agricultural colleges, where he has brought a practical knowledge of plant life to many hundreds of students, and inspired to a special study of botany not a few who are now filling important positions as educators. Secondly, by means of a ready pen he has assisted materially in lifting the standard of the agricultural press and, therefore, the thought of the farming classes. This has been supplemented largely by frequent addresses before a wide range of conventions, associations, and farmers' institutes. A product of the farm, he has kept close to the soil in the best sense, always striving to advance the cause of agricultural education. He has shown his faith in it by his works for it.

Gleanings from the Bulletins.

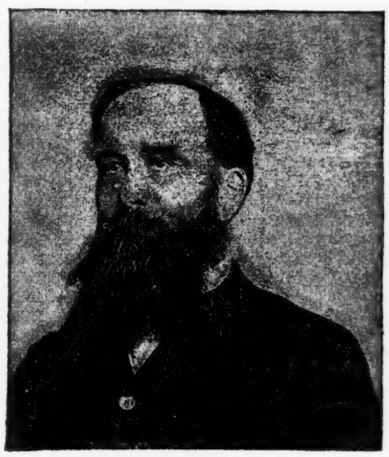
CONNECTICUT—No. 107, pages 8. This is a report upon the establishment made between a form of fungus upon the red cedar and a rust of the quince and service berry, and is of practical value, as throwing light upon a related species that also lives upon the cedar, and in one form constitutes the rust so destructive to the apple. It is evident that the presence of cedar trees near orchards is detrimental to the fruit interests of the country.

CALIFORNIA, No. 90, pages 4. Under fiber plants for the State ramie and flax are considered. When no returns from the crop are made to the soil ramie will exhaust the land more rapidly than cotton or wheat, and it is only strong soils that can be expected to produce large crops of this fiber plant. There seems to be no doubt that in the central and southern parts of the State the crop can be grown, and its profitableness will depend upon the perfection of the processes for marketing the fiber. It has been assumed that flax culture is unprofitable in California, and this erroneous impression is overcome with difficulty. The results of the experiments at the station show that for both seed and fiber flax can be grown, and the only point remaining to settle is that of the market, which will in a measure take care of itself when the crop is established.

KANSAS—No. 16, pages 16. The standard of sugar content of sorghum, it seems evident from the experiments, can be raised by selection. Smut has been troublesome with the sorghum, and the season of 1890 being a dry one was unfavorable for the test plats. No good results came from crossing the varieties. In the analyses of sugar beets maturity was found to determine the sugar content more than the size.

KENTUCKY—No. 32, pages 20. After a two years' trial with strawberries the following sorts are recommended: For early, Jessie and Cloud; second early, Forest, Eureka and Daisy; medium, Crawford and Bubach No. 5; very late, Gandy. Among vegetables, the following varieties are the best: Beans, Wax and Mohawk, New Union, Valentine; peas, Extra Early, Gem, American Wonder; lettuce, Prize Head; radishes, Rapid Forcing and French Breakfast; tomato, Favorite, Ignotum and Trophy; cabbage, Wakefield; corn, Early Landreth and Gold Coin; watermelon, Kentucky Wonder.

NEW HAMPSHIRE—No. 12, pages 14. From the fertilizer experiments recorded, the following conclusions may be gathered: Chemicals when properly mixed can take the place of farmyard manure and will give a greater increase of crop than commercial fertilizers. The average chemical composition of fertilizers for New Hampshire should be: Phosphoric acid, nine to eleven per cent; potash, nine to fifteen per cent; nitrogen,



PROFESSOR CHARLES E. BESSEY.

two to four per cent. The average of the brands now offered is phosphoric acid, eleven per cent; potash, 2.5 per cent, and nitrogen 2.5 per cent. After five years of testing the following is recommended for corn: Dissolved bone-black, 325 pounds; muriate of potash, 100 pounds, and sulphate of ammonia, seventy-five pounds; total, 500 per acre.

NEW YORK—(Geneva) No. 26, pages 32. This bulletin deals with the State fertilizer control; an outline of the history of commercial fertilizers, and the general principles underlying the use of fertilizers. In 1774 bones were first publicly recommended for use as a fertilizer; in 1814 attention was called to guano, and three years later superphosphate was made. To understand the nature of fertilizers the following subjects are treated: the constituents and food materials of plants, the constituents of soils, and the relations of soils and plants. The specific action of nitrogen, for example, is shown by three striking effects, namely: the greatly augmented growth, a deeper green color of the foliage, and the increase of the nitrogen in the plant.

NEW YORK—(Cornell) No. 26, pages 26. In the tests made with egg plants it was shown that this crop is adapted to cultivation in the North, the requisites being early starting, warm quarters, vigorous plants, late setting out, warm, rich soil, fighting the beetles and frequent cultivation. The best sorts for private use are: Early Dark Purple and White Chinese; for market, New York Improved and Black Pekin. In crossing, the purple-fruited sorts are best able to transmit their color to offspring, whether used as male or female. The white-fruited are stronger in transmitting form and productiveness. Few seeds are produced by artificial pollination even if excess of pollen is used, and it is probable that the egg plant may produce fruit without the aid of pollen. The botany of the egg plant is given, *Solanum melongena*, var. *esculentum* Nees, being the ordinary form with its two varieties, namely, var. *serpentinum* having a long crook-necked fruit and var. *depressum*, a low, weak, spineless plant with purple pyriform fruit.

NEW YORK (Cornell), No. 25, pages 48. This is a summary of the work during the past year. Various methods of milk analysis are compared; cream raising by dilution. The hollyhock rust is treated. The following remedy is recommended: permanganate of potash, two tablespoonfuls; water, one quart, and apply to all diseased parts with a sponge. In the tests of removing the tassels of corn it was found an advantage to cut them away. It still remains to prove that it will be profitable for the farmer to do it. Sugar beets, considered as stock food, are not superior to mangels. The effects on fowls of nitrogenous and carbonaceous rations may be condensed to the following: chickens on an exclusively corn diet will not make a satisfactory development. The bones are fifty per cent stronger than those fed upon carbonaceous rations. Hens fed on nitrogenous rations lay more eggs, but they are smaller and of a poor quality. Hens fed on corn become sluggish and lay a few eggs of large size and fine quality. The flesh of nitrogenous fed fowls contain more albuminoids and less fat than those upon carbonaceous rations, and is juicier, tenderer and darker colored. The forcing of beans as a winter crop under glass is considered profitable. Potatoes obtained from various localities do not, when grown in the same field, necessarily give sound conclusions as to differences produced by climate. The same stock must be taken to various localities and tested. Shallow planting of cabbages gave better results than deep planting. The effect of a cross among plants was seen only in the offspring; that is, it was not immediate. The experiments indicate that squashes of the *maxima* species, as Hubbard and Marblehead, do not cross with pumpkins, but common crooknecks and scallop squashes belong to the same species as the pumpkins, and all these cross easily.

NORTH CAROLINA—No. 74, pages 20. Several garden vegetables are reported upon, including peas, potatoes, tomatoes and cabbages. With the tomatoes the tests, for example, indicate that an early crop may be obtained by proper forwarding of the plants under glass. For the midsummer supply, however, it is better to raise the plants as early as they can be grown without glass and set in very fertile, low, moist land. By making two later sowings in June an abundance of fruit may be secured until frosts come. Early plants cut back and started afresh are not as good as successive late crops from seed. Plants from cuttings are later and less productive than those grown from seed. Many sorts of tomatoes degenerate under poor culture. Fig culture is being investigated and will become one of the fruit industries of the State. Methods of propagation are explained. For a frosty climate the bush form is advised, and the plants can be protected by burying the branches in late autumn, as illustrated by diagrams in the bulletin. Fig plants will be distributed by the station to suitable applicants.

UTAH—No. 5, pages 22. From this record of potato trials the following facts may be gathered: The depth of planting does not materially affect the yield. Potatoes planted near the surface contain 23.1 per cent more starch than those planted deep, and are, therefore, more valuable as well as more palatable. Shallow tillage is better than deep culture. The yield decreases after passing beyond eight inches apart as it did when planted nearer than eight inches. There was less starch in potatoes grown close together; in other words, close planting gives more water. Rows three feet apart with the plants one foot distant in the rows, is recommended. Quality is of much importance in potatoes. Utah potatoes are very superior, and this fact should become generally known in the markets of the world. Good-sized potatoes should be used for seed, and neither one nor two eyes nor the seed end, nor the stem end of potatoes should be used for planting.

The Onion Maggot.—These white glossy pests reach full size in a few days, and develop from eggs laid by a hairy fly upon the leaves of the young onion plants. As a remedy scatter unleached ashes over the young plants before the fly has made its appearance. Gas lime has been effective in keeping the flies away when scattered between the rows. It is well to gather and burn the diseased and therefore wilted plants, and thus destroy the maggots.

Cabbage Worms.—For this pest it is recommended to mix thoroughly one ounce of Paris green to six pounds of flour and apply to the plants while they are wet with rain or dew. Use the mixture freely before the plants begin to form heads, and lightly only afterward, and do not apply the poison within three weeks of the time the cabbage is to be used on the table. With proper care, those who have tested this say there is no danger.

Sheep Raising North of Kansas.—C. L. F. Boling, Kansas: Good land may still be had for this purpose in Wyoming, Idaho, Montana and North Dakota. Of the four Montana is probably best, on account of the water supply and excellent foothill ranges. Wyoming and Idaho come next. North Dakota is better suited to the business on a smaller scale, because there the sheep must be fed at home in winter more than in the other States, and cannot be managed at so little comparative expense. There is no better sheep in the whole world for any of these States than a good, three-quarter grade merino, the other quarter being derived from any of the Downs, but especially from the Southdown, Shropshire or Oxford-down. Cotswolds and Lincolns crossed with Merino also make good range mutton sheep, but are not nearly so good as wool producers, either as to the weight or quality of the fleece.

A Wire Fence on the Ground.—Aquatic, S. Dak., writes us that he finds if a wire is laid flat on the ground under a fence a hog will never go over the wire or through the fence anywhere, at least this has been his experience for some years.

Rye and Hungarian Grass as a Green Manure—T. H. Hopkins, Washington Co., N. Y., writes us: "Would you advise sowing half a bushel of Hungarian grass or millet per acre on a piece of rye before it is cut. Then cut the rye and let it lie on the ground and let the millet grow up through it, and then before frost comes plow it all under as green manure. Did you ever do it in this way, and what was the result?" We have not tried this method. Rye and millet are not desirable crops for plowing under. If you can grow a good crop of rye and a good crop of millet, the money they are worth, if used to purchase commercial fertilizers, will make the land far more productive than if they were plowed under merely for manure. Crops should be grown for food and not for manure.

Lime from Gas Works.—Charles A. Dean, Middlesex Co., Mass., wishes to use the refuse lime from gas works. If he can get it for the drawing, it can be used with advantage. The lime itself is good, but the gases it contains are liable to injure plants. To avoid this danger it is well to spread the gas lime on the surface in the fall and let it lie exposed until spring, and then plow it under. One hundred bushels per acre can be used with safety.

Cheap Fertilizers.—H. C. Hammond, Morgan Co., Ill., writes: "Please give us cheap sources of the following ingredients in fertilizers,—sulphate of potash, sulphate of soda, and muriate of potash." Sulphate of soda is not used in fertilizers. Common salt is a cheaper source of soda. You can get sulphate and muriate of potash from any of the large fertilizer manufacturers. The muriate, in proportion to the potash it contains, is the cheaper article. Mr. Hammond further asks: "Would it make any difference whether you give tomato plants nitrate of soda or nitrate of potash, ordinary saltpeter?" No, but the saltpeter does not contain so much nitrogen, and costs considerable more. For a trial on a small scale it may be more convenient to use the saltpetre and will do just as well. "In the May number of the AMERICAN AGRICULTURIST," Mr. Hammond writes, "you say 'value of soot depends on the ammonia or nitrogen it contains.' If ammonia and nitrogen are the same, would it be as cheap to get it from cotton seed meal as from soot?" Probably cheaper, especially if you fed the meal to animals and used the manure.

Stingless Bees.—H. O. Taylor: The stingless bee or *Mellipone*, of South America, belongs to a different genus than the *Apis* or Hive bee. One or two European and American beekeepers have procured a few swarms but they have usually lost them the first winter. These bees build comb, store honey, and rear brood differently, and according to all that has been learned of them are not great honey gatherers, and are not suited to the production of honey in this country.

Applying Guano.—Constant Reader, Moundsville, W. Va.: In using guano for flowers and vegetables for immediate effect it is best to apply with water at the rate of a tablespoonful to a gallon, using a watering pot in the application of the solution. But if this is not convenient and the plants are not in need of any extra moisture mix the guano with about three times its bulk of good, dry, and fine leaf mold, muck, or even fine loam from the garden; then apply a small handful to each plant, or scatter along the rows. By mixing with soil or some similar material the guano can be more evenly distributed and there is less danger of burning the leaves of the plant than when applied alone.

Onion Sets.—S. P. C., Jacksonville, Ill.: The best use to make of onion sets that are too large for planting and too small for cooking, is to sell them to the manufacturers of mixed pickles. If planted late and on moderately rich soils they might form good bulbs and not run up to seed. The experiment is worth making as a guide to future operations in the same line of gardening.

Whitewash.—Wm. H. Yule, Eau Claire Co., Wis.: The whitewash used by the Lighthouse Board of the Treasury Department of the United States is probably one of the best known for outside work, and it will probably prove satisfactory if you make it according to the following directions. Slake one-half bushel of good, clear, stone lime, in boiling water, keeping the lime covered during the process. Strain the slaked lime and add one-half peck of salt previously dissolved in warm water; three pounds of ground rice which has been boiled to a thin paste; one-half pound of powdered Spanish whiting, and one of clear glue dissolved in hot water; mix all together and let it stand for several days. Keep in a kettle and heat when used, applying the whitewash hot and with a painters' or whitewash brush, choosing a clear, dry day for the operation.

Fertilizing Salt.—Geo. Henirs, Philadelphia Co., Pa.: If you refer to German potash salt under the name of "fertilizing salt," we can say that it is a valuble fertilizer for fruit trees, but must be applied rather sparingly, or from one to four quarts per tree—according to their size and age—and used as a topdressing, spreading the salt over the surface and as far away from the stem as the branches extend. This German salt, or kainit, contains from twenty to twenty-four per cent of potash and thirty per cent or over of common salt. The latter if used too freely about fruit trees will destroy the roots, but is beneficial in small quantities, while as to the potash there is little danger of giving trees an overdose. Kainit is also an excellent insecticide, destroying the larvæ of many noxious insects burrowing in the soil.

Beans Mixing.—H. O. Damb, Clallan Co., Wash.: There is little danger of the common bush-beans mixing or becoming cross-fertilized with the scarlet runner or any other pole-bean grown in the same garden. In fact, different varieties of the pea and bean do not intermix readily even when raised in alternate rows in the field, and this is one reason why so many of the old varieties have remained so long pure and true to the original types. Occasionally a cross-bred variety may be discovered and if preserved and sown by itself becomes the parent stock of a new variety. The common bumble-bee is about the only insect that visits the flowers of beans, and while it assists in shaking pollen over the pistils of the flowers visited, it may sometimes carry a few grains to some other variety and cross-fertilize it, the resulting bean or seed showing that it is a cross between the two. The scarlet runner bean has been crossed with the Lima, but there is little danger of the two mixing under ordinary cultivation.

Cucumbers and Tomatoes.—R. L. Hamilton, Blount Co., Tenn.: The usual process of preserving cucumbers is to drop them into brine as gathered from the vines, and keep the cucumbers in this until wanted for use, pickling in vinegar. If they have absorbed too much such salt soak in fresh water for a few hours or days, then transfer to the vinegar jars or kegs. Putting up pickles is a business requiring experience, skill, and some knowledge of chemistry, and we may say the same of canning tomatoes, although almost every housewife tries her hand at it and some succeed in preserving a few for family use in the ordinary self-sealing glass jars. We cannot advise you to undertake the canning of tomatoes in tin cans with the hope of saving anything on the price at which they can be purchased at the country stores. Men who put up millions of cans annually are satisfied with a a few cents or even one cent on each can.

Wheat for Horses.—J. B. Henry, Vanderburgh Co., Ind.: Wheat is not a safe food material for horses. If given unground in any considerable quantities it is very liable to cause colic. Better exchange the wheat for wheat bran; mix that with corn meal, and feed the mixture on hay or straw cut and dampened.

Hackney Stud Book.—William Buchan, Caldwell Co., Mo.: The American Hackney Stud Book may be obtained by addressing Dr. W. Seward Webb, Grand Central Depot, New York. The first volume is now in press, and is expected to appear soon. For the English Hackney Stud Book address Henry F. Euren, Mercury Office, Norwich, England.

Corn-Harvester.—Dr. M. B. Brewster, Uinta Co., Wyoming: No device for harvesting and binding corn by animal power has yet been brought out of sufficient merit to "fill the long-felt want." Several attempts have been made in this direction, but none of them could do for the corn crop what the self-binder does for small grains.

Locust Fence Post.—Marion F. Smith, Wyoming Co., N. Y.: We consider the common locust as superior to the honey-locust as a timber tree. The latter may attain a larger size when the trees are mature, but in our experience the common locust is the more rapid grower of the two while young, and up to the time it is twenty years old. But we may add that the slower the growth the more dense and durable the wood. The locust timber grown on Long Island and on the light sandy soils of New Jersey has long been celebrated for its great toughness and durability, but that grown on rich bottom lands, or the rich prairie soils of the West, is of little value for posts, decaying in less time than white oak. Quick grown, soon rotten, is the rule with locust timber.

Corn Fodder.—William H. Swigart, DeKalb Co., Ill.: As determined by chemical analysis, a ton of well-cured corn fodder possesses the same amount and proportions of digestible nutrients as a ton of hay, except the albuminoids, or muscle-forming elements. Of these the proportion is as three and two-tenths in corn fodder to five and eight-tenths in timothy hay. Theoretically the corn fodder could be made equivalent to the hay in feeding value by the addition of a little wheat bran, oil meal, or still less cottonseed meal. But results in the feed rack are not always like those in the chemical laboratory. In actual practice from twenty-five to forty-five per cent of corn fodder is lost in feeding. A large part of the butts is left unconsumed, and to this must be added imperfect curing, overripeness, weather-beaten outsides of shocks, etc. In fact, it is not safe to count on more than forty-five per cent of the theoretical value of corn fodder, cut up, shocked and husked in the field. Two tons are therefore about equivalent in feeding value to one ton of timothy hay. (2) Corn stalks cut green, after the kernels are glazed, are theoretically worth about one-fifth

their weight of dry corn fodder, the difference being caused by the greater amount of water in the green stalks. But in practice the comparative value of the green stalks is much greater than one-fifth, as they are eaten up clean, with little if any loss. (3) Cutting up and sowing the fodder does not in the least diminish the quantity or value of the corn. On the contrary, flint corn is much better for all purposes, if cut up as soon as the kernels are glazed and allowed to mature in the stook. Dent corn, however, should stand until the kernels are moderately hard. The subject is an important one, and we are glad to see it agitated. "There's millions in it."

Unfruitful Cherry.—H. Daniels, Jeff. Co., Ind.: We cannot tell why so many of the blossoms on your early Richmond cherry tree fail to set fruit, but there may be some fault in the stamens, or pistils, one or both failing to become fully developed. Plant another tree of the same variety near by, and when the younger tree comes into bearing it may remedy the fault in the older one. There is often a want of sexual development in the flowers of individual trees which prevents the usual productiveness of the variety, and when the fault is in the staminate flowers a supply of pollen must come from some other tree to make good the deficiency, and for this reason it is always well to plant two or more trees of the same or some closely related variety near together, or at least in the same garden.

Forage Plants.—Subscriber, Fredericton, N. B.: We do not think the Southern cow pea would suit you as a forage plant, as it is a troublesome plant to harvest and rather difficult to cure for hay, especially in regions where showers occur in haying time. For an annual forage plant some variety of millet might answer, but all make a rather coarse hay and not at all adapted to the use of horses, although relished by cattle. For a rank-growing and nutritious perennial grass we do not know of a better species than the one commonly known as orchard grass. It succeeds best on light rich soils; comes forward much earlier than timothy, and if cut while in bloom makes excellent hay. It should be sown alone and rather thickly to prevent the stems growing too rank and coarse. Try a small plat of this grass and determine for yourself its value on the farm, for it may not succeed.

Sulphate of Ammonia—Soils.—Aug. Johnson, Tasmania: 1.—Sulphate of ammonia may be applied with benefit to almost all kinds of crops grown on limestone or other soils. If lime has been applied as a topdressing, delay the application of the ammonia for two or three weeks, then apply as usual. 2.—Volcanic soils are those formed by the decomposition of the ashes, rocks and lava thrown out of volcanoes, either recently or many centuries ago. 3.—Basaltic soils are formed of decomposed basalt, a variety of trap-rock, sometimes assuming columnar structure due to some modification of the crystalline force. All rocks, no matter how hard, are slowly decomposed by the action of the air, frosts, and water, and their chemical elements set free, these in turn becoming nutriment for vegetation. 4. Alluvial soils are those composed of deposits of mud, soil, sand, gravel, and vegetable matter brought down by streams from higher elevations and spread over the lower land forming the banks or what are generally termed the "bottom lands," bordering rivers, creeks, inland lakes, and bays on the seashore. Alluvial soils are the most quickly made.

Cutting Asparagus.—Mrs. M. G., Polk Co., Fla., writes: "A year ago last September I set out 120 two-years-old asparagus roots. I made a rich bed and set them out according to your directions. Last spring I gave it a good dressing of salt, and a little later fifteen pounds of nitrate of soda. In the fall I covered the bed well with barnyard manure. It has started up very fairly now (Feb. 24), and two weeks ago I hoed in the manure. I have cut from it enough for two or three small meals. I would like to know if I should cut down all the shoots that come up, whether large or small, as long as we wish to use from the bed, or if it is best to let the slim ones grow on, and only cut the good-sized ones?" Your bed, for the short time it has been planted, has done remarkably well. It would be better not to cut so young a bed at all. But if you cannot resist the temptation, cut as little as you can and let the rest grow. It is the vigorous growth this season that stores up food for the shoots next spring. It is a general rule in cutting asparagus "as long as you cut at all cut everything clean, little and big," but this rule has no reference to the crop the following year. It simply means that if you allow the small shoots that are not worth cutting to grow they will draw the nutriment away from the roots and rob the other shoots and make them smaller. But so far as the crop next spring is concerned the more you allow to grow the better. If set out three feet by one and a half feet, the 120 plants occupy the eightieth part of an acre, and fifteen pounds of nitrate is equal to 1200 pounds per acre. If you continue as you have begun, and cover the bed every year with manure and apply fifteen pounds of nitrate in the spring, you will soon have a splendid bed of asparagus. The manure will furnish all the potash and phosphoric acid required. But four or five pounds addition of some superphosphate or complete fertilizer would be a safe application each year. But do not omit the nitrate of soda or sulphate of ammonia. Asparagus needs nitrogen.

Strawberry Tree Aphis.—R. B. T., Kent Co., R. I.: The minute insects infesting the strawberry tree (*Euonymus*) are a species of aphis, usually called "green fly," or plant lice, when they appear on house plants. They may be destroyed with tobacco water when attacking plants in the garden, but fumigating with tobacco is the usual practice in greenhouses. These aphides or plant lice suck the juices of plants, always attacking the soft, young twigs, checking their growth and causing the leaves to curl up and die. They usually disappear after a few days of hot, dry weather in summer, but may do considerable damage before they depart.

Tent Caterpillars.—Subscriber, Nyack, N. Y.: We do not agree with those who advise cutting down the wild cherry trees and bushes because they appear to be the favorite food of the apple tree tent caterpillar, which has been wonderfully abundant and destructive the present season. Better leave the wild cherry trees to attract this pest away from your orchard and then destroy it while on the cherry trees. When the cherry and apple trees are stripped of foliage these caterpillars will visit the pears, plums, peaches and various cultivated shrubs, or even find plenty of food in the forests. By all means give them their favorite food, for then you can have them handy when you are ready to destroy them. Many thousands of large old apple trees have been stripped of leaves and fruit when five minutes spent in clearing out the tents, when the caterpillars were first hatched, would have saved the tree. Many a farmer could have earned a dollar a minute at this work had he begun in time.

Snowball Louse and Currant Borer.—William Foss, Cuyahoga Co., Ohio: The minute insects now swarming on the leaves of your snowball bushes, causing them to curl up and die, are a species of flea louse (*Psylla*), and may be called the snowball flea louse. These insects somewhat resemble the aphis or plant lice so common in greenhouses, but they belong to a different family. When disturbed they jump quite briskly; hence, their popular name of flea lice. There are many species, or at least are so classed by entomologists, and their specific names are usually derived from the plants upon which they are found feeding. The one found on the blackberry has been named *Psylla rubi*, the one on the common garden evergreen box *P. buxi*, and so on to the end of the list. The one infesting the snowball has become widely distributed in the past few years, and we have not as yet discovered any better means of destroying or checking its ravages than to cut off the infested twigs and leaves and burning them, and this is about as injurious to the bushes as leaving them to be destroyed by the lice. To get rid of currant borers cut out all infested shoots early in spring and burn with their contents.

Amaryllis from Seed.—C. E. S., New Jersey, asks us: "How can I grow amaryllis from seed? I have a small greenhouse and succeed well with most seeds, but cannot make amaryllis seed germinate." The seed should be sown as soon as ripe, in pots, pans or flats filled with a light fibrous soil, placed edgewise, eye down and but barely covered with the same soil, water thoroughly and cover with a plate of glass to prevent evaporation, and to keep the soil evenly moist. If convenient, give them a little bottom heat and keep in an even temperature. The seeds will soon germinate, if good. When the young plants are three inches high prick out singly in thumb pots filled with good strong soil; give them ordinary greenhouse treatment, water with care, so that they never suffer from extremes, as too much water is as injurious as letting them dry up; the soil should always be moist, but never muddy. Most of the amaryllis require a season of rest, which will be indicated by the drooping of the leaves. At this period place the pots under the bench where they can remain until spring or early summer, when they should be brought into active growth, either by putting them on the bench again or by planting in the open ground; the latter course is frequently adopted, but we prefer repotting and plunging the pots in a partially shaded frame for the summer. It is far better to always keep the bulbs in pots, and in shifting not to disturb the balls. Always keep them in small pots so that the roots pretty nearly fill the pots. Most varieties will flower the third year from sowing.

Expansion of Metals.—John D. Knox, Jr., Shawnee Co., Kansas, asks what metal is most sensitive to heat and cold. Mercury, or quicksilver, is perhaps more susceptible to heat and cold than any other metal. It solidifies at 39° below zero, F., and crystallizes in regular octahedrons; the mass is then malleable and resembles lead. Its boiling point is 662°, at which it forms an invisible, transparent vapor.

Currant Worms—Deodorizer.—Robert B. Treat, Kent Co., R I.: The worms you find feeding on currant bushes, and of which you send some badly dried and smashed specimens, are probably the now common imported currant worm (*Nematus ventricosus*). These worms are the larvæ of a saw fly which appears early in spring, the female flies deposit their eggs on the underside of the leaves, where they hatch in a week or two, and then the grubs commence their work of destruction. We have also a native saw fly, the *Pristiphora grossularia*, the larvæ of which attack both gooseberries and currants, and in the same way as the imported pest. Another and often very abundant pest is the caterpillar of a small yellowish moth, the *Eufitchia ribearia*, usually known as the gooseberry span worm. Fortunately all these species are readily destroyed by dusting the plants with white hellebore, or by steeping the powder in hot water for a few minutes, then add cold water and sprinkle the bushes with the solution. Perhaps one of the best and cheapest deodorizers to use in a stable is common dry land plaster. It is not only worth its cost as a fertilizer, but acts as a deodorizer when scattered in the stable. Kiln dried loam or peat from the swamps may be placed next to plaster for the same or similar purposes.

Cheap Nest Eggs.—S. H. McEathron, Stephenson Co., Illinois, writes us that he makes nest eggs by breaking a small hole in one end of an ordinary egg, pricking the other end with a pin and blowing out the contents, and then filling the empty shell with plaster of paris. A dozen nest eggs can be made by this method in a few minutes.

Water Foxtail.—A. G. Chase, Leavenworth Co., Kan.: This little grass, known as *Alopecurus geniculatus*, with its variety *aristulatus*, is a small native species, closely allied to the timothy. It occurs in many parts of the country, but is of no special value for forage. It is common in the Northwestern Rocky Mountain States, where it is plentiful along streams and in damp places. The variety represented by this specimen is more abundant than the species, and frequently attains to a larger size.

American Pomological Society.—Secretary G. B. Brackett informs us that the twenty-third session of the American Pomological Society will be held at Washington, D. C., on the 22d, 23d, 24th and 25th of September, 1891. An official programme will be issued at an early date. Meanwhile, special information in regard to this meeting may be obtained by addressing the Secretary at Denmark, Ia., or President, P. J. Berckmans, Augusta, Ga. This session is held in Washington on a special invitation of the Secretary of Agriculture, and promises to be a meeting of unusual interest to all persons interested in pomology and horticultural matters in general.

AMERICAN AGRICULTURIST
FOUNDED IN 1842
JULY, 1891.

A Great Discovery.

The wonderful development of the mines, mills, factories, and railroads of the Southern States is one of the great industrial movements of the age. The first great Southern industry to attract the attention of foreign capitalists, and the one of greatest importance, since it stimulated the lagging agriculture of that section, was the mining of the deposits of phosphate rock in South Carolina. For twenty years these phosphates have supplied the greater part of the phosphoric acid used in commercial fertilizers consumed in this country, and the demand for foreign shipments have been large and steadily increasing. Indeed, the output of South Carolina rock has been very nearly 500,000 tons per annum for several years. Under the stimulus of this local supply of fertilizing material, factories for the manufacture of fertilizers have multiplied throughout the Southern States, and the enormous production of manufactured fertilizers has done much to make farming profitable.

From time to time scientists and engineers have prophesied the speedy exhaustion of these phosphatic deposits, but as yet no perceptible diminution is apparent either of product or sources of supply. As if to provide against such a national calamity as would be caused by the exhaustion of these deposits, other and perhaps larger and more valuable mineral phosphates have been discovered recently throughout central Florida. That State has enjoyed a phosphate "boom," almost rivaling in speculative excitement the California gold fever. Many millions of dollars have been invested in these new mines in the last eighteen months, and a wonderful activity is now going on in this naturally placid State. Speculation has run rife. Fortunes have been made in a day as it were, and sometimes lost with almost equal rapidity. This phase of the industry is now passing away and systematic development of these deposits is being inaugurated on scientific principles.

The phosphates of South Carolina are remarkably uniform in analysis, only a trifling variation being found in any deposits in that State. But in Florida the widest range of value exists. Rock containing eighty per cent of bone phosphate of lime is often found in conjunction with a much poorer quality, or with carbonate of lime and other obnoxious materials, with no distinguishing physical peculiarities. Much difficulty has been experienced in successfully dealing with this class of phosphates.

The most peculiar formation, however, and the one of greatest uniformity in composition, is the pebble phosphate. These phosphatic pebbles exist in enormous beds of unknown depth, found in the bottom of Peace river and its affluents, in the old beds of rivers, and in swamps, and low lying sections. In almost all cases they are covered with an overlying deposit of sand and earth. When this crust is dug away, the pebbles of phosphate of lime, mixed with sand and dirt, are raised by huge dredges, the sand and foreign matter are separated by washing and sifting, and the phosphatic pebbles are ready for shipment to the fertilizer factory. The river deposits are worked by large suction pumps that raise the gravel and mud by suction. The washing is easily managed, and the cost of mining pebble phosphates is ridiculously small. The extent of the Florida phosphates is unknown as yet, although it is probable that the pebble phosphate deposits are now quite clearly determined.

The development of these deposits is stimulated by an unusual demand for mineral phosphates. This is due to a shrinkage in the output of European phosphate mines, and also to the cutting off of a very large supply from South Carolina, owing to legal complications. The discovery and development of these Florida phosphates is a matter of national importance, guaranteeing, as it does, an abundant supply of plant food at reasonable prices.

An Injustice to the Pacific Coast.

A traffic arrangement which the interstate commerce act was designed to guard against is now laying under tribute a vast industry on the Pacific coast. It is also maintaining an arbitrary monopoly that deprives the people of their rights under the tariff laws of the country. While granulated sugar is wholesaling on the Atlantic seaboard at about four cents per pound, it commands six cents at San Francisco.

The combination which controls the Sandwich Islands product and other sources of supply for the Pacific coast has an agreement with the railroads of the country whereby they are to haul sugar from the Atlantic seaboard only as far as the Mississippi river. Beyond that line the freight on sugar from New York is so high as to be practically prohibitive. On the other hand, freight on sugar from San Francisco east is enough lower to enable the Pacific coast syndicate to sell its surplus at a profit in the cities of the great plains. By this division of territory an unlawful traffic combination enables the Western monopoly to keep its prices fifty per cent higher than prevail on the Atlantic coast.

This extortion is a tremendous burden for the large canning and packing interests on the Pacific slope. California packers find themselves handicapped this year by having to pay fifty per cent more for sugar than packers on this side of the mountains, while the freight on their goods is not reduced enough to make up this tax. The entire consuming public also has to suffer by this conspiracy.

The remedy is very simple. Let the Pacific coast consumers of sugar — especially the fruit-packers—enter formal complaint before the interstate commerce commission. It will be comparatively easy to demonstrate the facts of the case. It is only required that the above statements be legally confirmed to lead the commission to enforce such a reduction as shall be only a fair and reasonable rate for transporting sugar from New York to San Francisco.

The evils of the deal referred to would be mitigated if it was so managed as to specially timulate the production of sugar in the Western States. The San Francisco price of six cents will, of course, give an impetus to beet sugar production in California, but not on this side of the Rockies, where the surplus is disposed of at competitive prices. The national bounty on sugar is, fortunately, proving a great stimulus to the industry. Not for years have the sugar fields of Louisiana been so extended as at the present season, while the beet sugar industry is attracting much attention in the prairie States.

A Plea for the Roadsides.

While there is a strong and increasing demand for a higher education of women, and a growing sentiment for a better education of farmers in their own calling, there is a great, yet a slumbering demand for the education of farmers in still another direction. Any one who has traveled through England, or on the Continent, and noted the well-kept roadways, shaded for the comfort of travelers and the greater improvement of the country itself, and then makes a tour through portions of our own country where the roads are merely raised beds of gravel with the roadside fences piled high with stone heaps and stumps drawn from adjoining fields, with an absence of shade trees, and no attempt at improvements, will keenly appreciate this need of a greater education among farmers. Where highways depend entirely upon local effort for their maintenance or improvements there is a great need for a better appreciation of the importance of improving the highway in appearance. There is no reason why the roadside should be a dumping place for the refuse from the farm; nor why it should be allowed to grow up with bushes and weeds of every description. The farmer who prides himself upon the cleanliness of his farm has great reason to protest against the course of those who allow thistles and other foul weeds to mature their seeds upon their side of the roadway. The traveler along the highway has every reason to condemn the neighboring farmers who keep their roadway and the roadsides in such a manner that travel is uncomfortable and the appearance of the roadway unpleasant to the eye.

Farmers should have enough local pride to inaugurate certain plans of improvement without waiting for the stimulus of legislative enactment. There should not be any necessity for an act of the legislature requiring farmers to cut seed-bearing weeds, neither should it require a law to induce farmers to plant shade trees, and every path master should know enough and have enough enterprise to plant a finger post at each four corners or at any other place where travelers are liable to take the wrong turn; and farmers themselves should go even farther than it is possible for the law to lead them. Especial pains should be taken with the grading of the roadside and to see that it is kept smooth and sightly, and certainly every road district should have a watering trough where horses or other animals that pass along the highway may quench their thirst. If farmers would devote one or two days during the year to the improvement of the roadside the appearance of the rural districts would be very much changed for the better in the course of the next five or ten years, and the farms themselves increased in money values.

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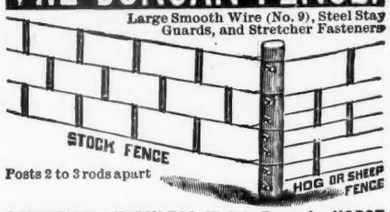

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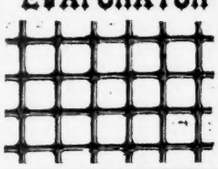

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ISSUES OF THE DAY.

Permanency of Agricultural Production.

C. WOOD DAVIS.

The April Report of the Department of Agriculture contains a remarkable essay by the Statistician of the Department under the above title, which is epitomized in the June number of the AMERICAN AGRICULTURIST. The essay is as remarkable for its omissions as for its contents, as well as for the fact that it contains nothing relating to the subject indicated in its title. It is simply an attempt to demolish hypothetical disciples of Malthus who are engaged in the reprehensible business of giving farmers encouragement by showing that the world is about entering upon an era when consumption will overtake production, and possibly get a lead in the race,—to result in satisfactory prices for all the products of the farm.

It is not the purpose of the writer to review the essay as a whole, as space does not permit, but to show how unwarranted are some of the assertions and conclusions when viewed in the light of well-established facts. This will be done by an examination of the world's production of breadstuffs and by showing that the essayist has overstated the average product of Europe by counting Turkey as well as its dependencies twice.

A Vitally Fatal Mistake of the essayist is that he ignores the fact that for ten years there has been practically no increase in the world's wheat area and but little increase of product. It is true that the acreage shows an increase of some 3,275,000 acres, but this has been in such areas as give a very low average yield. Yet there has been a decrease of 600,000 acres in Britain, where the average is nearly thirty bushels per acre. The result is that the net increase in productive power is equal to but 15,000,000 bushels, or the product of about 1,250,000 average acres. Facts of this character are ignored, although they are of such vital importance in determining the productive power of the wheat fields of the world. Admitting, for the moment, the Statistician's contention that Russian fields must have increased, what is its significance? The Russian average yield is about seven and a half bushels per acre, and for each acre that the wheat fields of Britain are reduced at least four acres must be added in Russia to keep up the yield. During the entire decade such reductions as have occurred have been where the yield has been greatest, while the additions have been in the areas of lightest yield.

A Second Fatal Error is the ignoring of the fact that in the ninth decade the bread-eating populations have increased by more than 60,000,000 or 15 per cent, as against an increase in the wheat acreage (any part of the product of which finds its way into the channels of commerce) of but 2.3 per cent; while, as has just been shown, the productive power has increased less than two per cent owing to the reduction of the productive area of Britain as against an increase in less productive regions.

A Third and Quite as Fatal an error is the complete ignoring of the diminishing supply of rye, while four-fifths of the bread-eaters of the world live in Europe where forty-seven per cent of the bread consumed is made from rye. The production of rye has not only declined relatively, but has actually diminished during the past twenty years, if acreage is any criterion. Meanwhile the ratio of rye to population shows a remarkable diminution, as in 1870 the proportion of rye to wheat consumed in Europe was 52 to 48, whereas now it is but 47 to 53.

So great has been the increase in the population of Europe that the yearly quota of rye, for each unit of the population, has diminished from 4.2 bushels to 3.4, such decrease being eight-tenths of a bushel. This multiplied by the present population would give a deficit of some 296,000,000 bushels. For this great deficiency wheat or other food must be substituted. The extent to which wheat has taken the place of the lacking rye accounts for the absorption of the vast volume of wheat produced in excess of ordinary requirements from the middle of the eighth to near the close of the ninth decade. During this time little or no heed was given to the scarcity presaged by the diminishing rye fields, as there was no pinch, but when the supplies of a population, so great as that of Europe, falls in the rear of augmenting numbers at such a rate that the yearly bread ration—counting half the European ration as rye—is diminished 10 per cent, the pinch will assuredly be felt just as soon as the article substituted also becomes relatively scarce. Such is now the case with wheat, owing to the clearly established fact that for ten years the wheat fields and the bread-eaters have increased in the ratio of one to six and a half. When we consider both the wheat and rye fields the divergence is such that the ratio is as one to ten.

In dealing with this question it has been customary in this country and England to pay no attention to the rye fields; probably from the fact that neither people are eaters of rye. Now the rye fields are just as important factors as are those of wheat and the official who ignores so important an element of the problem is hardly warranted in making such sweeping assertions as those which characterize the essay.

The Supply of Other Foods.—For more than a year the writer has been engaged in gathering official data as to the acreage in potatoes, and each kind of grain, at the close of the seventh, eighth, and ninth decades, in every grain-growing country of the temperate zones where an effort has been made to collect such data. He has so succeeded that he has been able to complete a tabulation showing the acreage in such crops at the times named. It is doubtless the first tabulation attempted, taking in the whole grain-growing areas of the world.

From these tables we learn that in twenty years the European area, in all kinds of grain and potatoes, has increased 4,662,000 acres, being 1.26 per cent. The area of the world, in such staples,—exclusive of the United States—has increased 14,473,000 acres, being 4.1 per cent, as against an increase in the bread-eating populations of 28.1 per cent. Including the United States the increase, in the area devoted to grain and potatoes, has been 100,793,000 acres or 20.5 per cent. In other words the consumers have increased one-third faster than the great food staples.

Of the increase of 100,793,000 acres, no less than 82,134,000, or seventy-six per cent, must be credited to the United States. As our additions of new acreage are now less than half what is required to meet home needs, we can no longer increase our contributions to the wants of Europe, but must curtail them in the same measure in which new acreage fails to meet home requirements. Hence it looks as though a period of scarcity was not far off. This appears the more probable when we remember that the per capita acreage of wheat and rye, for the bread-eaters of the world, is now one-tenth less than twenty years since, and that the pinch would long since have been felt but for the great reserves resulting from the excessive increase of acreage during the eighth decade and the development of Indian exports.

Another Fallacy.—The Departmental essayist says: "Another fallacy relative to cereal production is that it is perceptibly declining in Europe." He then tabulates five years' production of one cereal (wheat) to show that there has been no such decline. The curious part of this table (and another purporting to show the world's production) is that he includes Turkey in the table, and then goes on to say: "It should be remembered, however, that Poland, Finland, European Turkey, Bulgaria, Roumelia, and certain principalities having an area of more than 320,000 square miles are not included." The same statement is made in relation to these countries being excluded from the table of the world's production, with the absence of any mention of the "certain principalities"; although in the table Turkey and its dependencies are explicitly included and every schoolboy knows that Bulgaria and Roumelia are Turkish dependencies, as does every tyro in statistics that the estimate of 37,000,000 bushels, which he credits to Turkey, includes the product of both Bulgaria and Roumelia and is, at best, but a commercial estimate that was current even before these provinces had a separate autonomy.

Can there be any value to statistics that twice include the same area and product and speak of "certain principalities," when the entire continent has been included by name except Montenegro, Andorra, and San Marina which, combined, annually produce less than 300,000 bushels of wheat?

What reliance can be placed on the figures furnished by a Department in the official reports of which such errors are published?

The Statistician, in this essay, credits Greece with a yield, in 1890, of 12,278,240 bushels of wheat, whereas the Hon. A. Loudon Snowdon, United States Minister to Greece, writes me on March 6, 1891, that the wheat product of Greece was, in 1890, but 1,307,200 bushels harvested from 142,200 acres, and that the acreage ten years earlier was 141,300.

The Real Facts.—Accepting the figures published from time to time by the Department, when they do not vary too much from other official data, a careful tabulation shows the wheat crops harvested in Europe and the world, during each of the last ten years, to be as follows:

	European Product. Bushels.	*World's Product.* Bushels.
1881	1,142,967,000	1,977,477,000
1882	1,293,503,000	2,263,178,000
1883	1,159,150,000	2,050,288,000
1884	1,278,427,000	2,263,183,000
1885	1,198,754,000	2,076,959,000
1886	1,099,620,000	2,042,528,000
1887	1,360,165,000	2,267,056,000
1888	1,275,186,000	2,182,673,000
1889	1,125,102,000	2,048,372,000
1890	1,294,339,000	2,185,051,000
Annual averages	1,222,721,000	2,135,676,000

As these figures are larger than those published by the Department, it is clear that the Statistician overstates the product of Europe when he asserts that "the real average in the last five years may be fairly stated in round numbers at 1,250,000,000 bushels," as he overstates the world's product by nearly or quite 100,000,000 bushels when he says that "the grand aggregate cannot be made much less than 2,250,000,000 bushels."

The Point Involved.—When we reflect upon this question we see that it is of little significance whether Europe or the world produces this or that amount of wheat; the real marrow of the question is whether the production of wheat and rye—and the subject cannot be properly treated unless both are included—has of late years increased in the same proportions as the consuming populations and whether the supply in 1870 was overabundant? The prices obtaining twenty years since are conclusive as to the character of the supply at that time, and show it was not excessive, as prices current in later years show that the supply has since been overabundant, while the ascending scale now indicates the exhaustion of the reserves.

Although the European crop of 1890 *has been exceeded but once in ten years, and the world's* 1890 *out-turn equaled only by the crops of* 1882, 1884 *and* 1887, *yet we see prices steadily advancing.* This would be a most anomalous state of affairs were current productions (with average yields per acre) sufficient for the world's current needs. There was no such advance when the world's harvest was 143,000,000 bushels less, as in 1886, because at that time there were great reserves, and the bread-eating world's needs were less by fully 140,000,000 bushels of wheat and rye.

A Tough Question.—If the pinch is not now upon us how is it that *with a European product, from the harvest of* 1890, *greater by more than* 70,000,000 *bushels than the average of the last ten years, and that of the world greater by* 50,000,000 *bushels, that wheat is scarce and the price so much higher than of late years?*

With the world's product (from an average acreage yield) now about 100,000,000 bushels less than the world's current needs, and the growing European crop estimated at 200,000,000 bushels below an average, and the rye crop estimated as likely to be from 50,000,000 to 100,000,000 bushels short, what are the probabilities as to the price of wheat this day twelvemonth?

With current production 100,000,000 bushels less than current needs, and acreage increasing not one-sixth as fast as population, when are the reserves likely to be replenished?

The Tax Problem.

CHARLES L. HILL.

"The relief of personal property from taxation . . . . . would be the keynote to the redemption of abandoned farms and wasted lands." This unwarrantable statement is found in the closing paragraph of an article on the above topic in the April number of the AMERICAN AGRICULTURIST. The contributor who writes these words labors to show that capital is attracted to quarters in which it can most easily escape taxation. This is true enough. It is also true that the attracting of capital in any line means the enhancing of values in that direction. Hence, if personal property should

(*Continued on Page* 417.)

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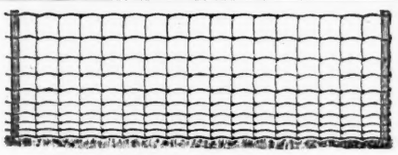

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UNITED STATES CREAMERY DIRECTORY No. 3., compiled and published by James Slocum, Holly, Mich.

The labor entailed in securing information necessary for a book of this kind must have been much larger than those unfamiliar with work of this nature can appreciate. The various States are alphabetically arranged, and so are the counties within them. There are four columns throughout the book. In the first column is given the post-office, in the second the name of the creamery, in the third that of the proprietor, and in the fourth the system in use, separator, or gathered cream. To judge from the many inquiries we have received about this very information, there must be a large demand for the work. Sold by the Orange Judd Co. Price 50 cents.

SEVENTH BIENNIAL REPORT OF THE KANSAS STATE BOARD OF AGRICULTURE; for the years 1889-1890. Transmitted by M. Mohler, Secretary State Board of Agriculture, Topeka, Kan; cloth, pp. 260.

A valuable report, containing descriptive statements, statistics and general information relating to each county, and the geographical and topographical features of the State, together with tables, statements, summaries and diagrams, showing the products, progress and development of the State; reports of the appointed officers of the board, etc.

MARYLAND'S RESOURCES: Report of J. Thomas Scharf, LL. D., Commissioner of the Land Office of Maryland; paper, pp. 148. George T. Melvin, State Printer, Annapolis, Md.

A series of carefully prepared articles on Maryland's resources, with a description of every county in the State, the character of their soil and climate, their resources, the price of land, etc., and the inducements they offer to attract capital and population, including a sketch of the marsh lands of Maryland.

THE READER'S GUIDE IN ECONOMIC, SOCIAL AND POLITICAL SCIENCE: Edited by R. R. Bowker and George Iles; paper, pp. 169. G. P. Putnam's Sons, Publishing Agents, New York and London.

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ANNUAL REPORT OF THE SECRETARY FOR AGRICULTURE, NOVA SCOTIA; transmitted by George Lawson, LL. D., Secretary for Agriculture, Halifax, Nova Scotia; paper, pp. 330.

This report contains much interesting information and shows that our neighbors are active and sincere in their efforts to promote the interests of agriculture.

PASSION FLOWERS AND THE CROSS; by Emma Howard Wight; paper, pp. 247. Calendar Pub. Co., Baltimore, Md.; price 50 cents.

A strongly told story, full of pathos and passion The work reveals the wonderful familiarity with widely divergent phases of human character possessed by its author.

JOURNAL OF THE COLUMBUS HORTICULTURAL SOCIETY, Vol. V, 1890. Prepared by Clarence M. Weed, Secretary; cloth, pp. 305. Published by the Society, Columbus, O.

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POEMS, SKETCHES OF MOSES TRADDLES; pp. 64 The Traddles Co., Cincinnati, O.

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REPORT OF THE UNIVERSITY OF ILLINOIS; for the two years ending September 30, 1890. Transmitted by William L. Pillsbury, Secretary of the Board of Trustees, Urbana, Ill.; cloth, pp. 271.

Besides a full report, financial and otherwise, an excellent synopsis of the workings of each of the colleges of the university is appended.

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ISSUES OF THE DAY.

(*Continued from Page* 414).

be relieved of all taxation its value would increase, as its attraction for capital would become greater; and, if all the burdens of taxation were thrown upon land, capital would hold aloof, and land values would decline instead of advancing. Landowners would see the one escape from taxation, and the only thing that would prevent a general exodus from the farm would be the lack of purchasers for such property. What fixes the market value of any commodity is the popular attraction it possesses. Would placing all the taxes upon land make real estate more attractive? Would the entire exemption of personal property from taxation make such property less attractive? How then would such tax laws cause a rush from the factory to the deserted farm?

In the quotation given, in which Mr. Enslee would have the farmer say to the capitalist, "Come, locate on my property; I will not oppress you; come to me for I can't go to you and we must come together or my property is worth nothing; and, knowing this, I will not tax you or oppress you," there might be added the further promises: (for they are really included in those made): "I will guarantee you the benefits of the best of State, county, and township laws and supervision at my expense; I will pay the police force for protecting your person and your property; I will educate your children in the public schools from the depths of my own purse; I will keep the highway in repair, build bridges and erect all needed public buildings—all this will I do under the penalty of the forfeiture of my farm whenever I fail in the least particular. In the meantime you shall have the privilege, at the polls, of increasing such expenditures and making my burden as heavy as you please."

Without doubt there would be "lots of fun" in such an arrangement. The boy who saw the crow plucking the eyes from the living toad, seeing but one side of the matter, shouted in glee and called it fun. But the fun for the crow was death to the poor toad.

There are two sides to the single tax scheme, and hundreds of thousands of farmers need no glass to see their side of it. If such a system should come in force there would be such a scramble to get out of the ranks of the landowner that farm values would shrink as they have never done before. The victim of the heavy mortgage would then be its holder, and, for once, he would be in no haste to foreclose.

Kind Words.

Would Not be Without it at Any Cost.—Every one in our house is interested in the AMERICAN AGRICULTURIST. I would not be without it at any cost. GEORGE F. DAVIS, Sullivan Co., N. Y.

Held in High Esteem.—Our table has never been without the AMERICAN AGRICULTURIST for many years. It is held in high esteem in our household. A. and E. GILL, Dutchess Co., N. Y.

Valuable for all Classes.—Although I am not a farmer, I find no better way of keeping myself informed on general affairs than by reading your valuable magazine. HATTIE SEYMOUR, Iowa Co., Ia.

Cannot Afford to be Without It.—The AMERICAN AGRICULTURIST is first-class in every respect. I could not afford to be without it, and should feel entirely lost after having enjoyed its reading for so many years. WILLIAM BROTHERDON, Cedarvale, Queensland, Australia.

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Is a sixteen-page book, giving directions for making water colors, coloring photographs, painting on silk, velvet, chamois, etc., dye embroidery, tapestry painting, etching upon cotton and linen, together with instructions for many other useful and novel ways of using Diamond Dyes and Diamond Paints. A copy will be sent free to any reader of this paper.

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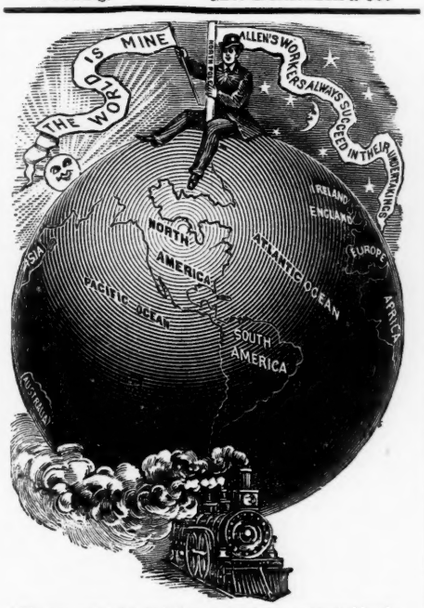

The somewhat fanciful picture above was suggested by the genuine pleasure and high spirits shown by one of Allen's workers. When he applied to me he was making just a living, or very little more. I taught him. I caused him to go to work, in his present situation, and he quickly began to earn money at the rate of **Over Three Thousand Dollars a Year.** Is there a lesson or suggestion here, for you, reader? Probably you can make just as much money as he. Why not try? I undertake to briefly teach any fairly intelligent person of either sex, who can read and write, and who, after instruction, will work industriously, how to earn **Three Thousand Dollars a Year** in their own localities, wherever they live. I will also furnish the situation or employment, at which you can earn that amount. I charge nothing and receive nothing, unless successful as above. Nothing difficult to learn, or that requires much time. I desire but one person from each district or county. I have already taught and provided with employment a large number, who are making over **Three Thousand Dollars** a year, each. Here is something **new** and **solid**. Full particulars **Free.** After you know all, if you conclude to go no further, why, no harm is done. Those who feel interested are invited to write at once. I promise you my special, personal attention. Address,
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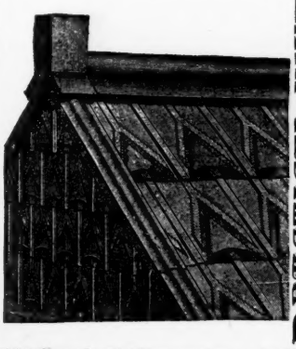

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Holds rupture under all circumstances.

Consultation Free.

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MATTERS OF BUSINESS.

The Summer Outlook.

The Wheat Crop. — The June report of the Statistician of the Department of Agriculture makes the area in winter wheat, as compared with the breadth harvested last year, 111.5; spring wheat, 103.4; barley, 107.1; rye, 101.5; oats, 97.9. Condition: — Winter wheat, 96.6; spring wheat, 92.6; barley, 90.3; rye, 95.4; oats, 85.1.

In comparison with 1889 the increase in wheat acreage is quite moderate. The reduction last year of more than two million acres suggests the reason for most of the present increase. This advance is, therefore, both replacement and development — the former notably in Illinois, Missouri, Kansas and California—the latter in less degree in Washington, Oregon, the Dakotas and in several territories. These violent fluctuations make the investigation difficult, and in some districts will render necessary supplementary work. To this extent present estimates may be considered preliminary. The extension of acreage, according to our correspondents, depends on price of wheat and not on available land. A large increment of wheat breadth is reported in Washington, "a large amount of new land is being broken for next year's crop," and the local opinion is expressed that not more than one-fifth of the wheat land of that new State is under cultivation.

The winter wheat crop is encroaching upon the southern and eastern borders of the spring wheat district, notably in Iowa and Wisconsin under the protection of crop diversification and new methods of cultivation, while spring wheat extension responds moderately to the stimulus of higher prices. The condition of winter wheat has declined only one point. The average of New York is 96; Pennsylvania, 97; Georgia, 98; Texas, 98; Ohio, 99; Michigan, 90; Indiana, 99; Illinois, 98; Missouri, 99; Kansas, 95; California, 97.

The first monthly statement of averages of spring wheat makes Wisconsin, 77; Minnesota, 89; Iowa, 95; Nebraska, 97; the Dakotas, 96. Early sown wheat was injured by frost in Wisconsin and Minnesota. Germination was arrested by drought in the same region. In South Dakota, drought has retarded growth. Conditions have been more favorable generally in North Dakota. Recent rains in Nebraska and Iowa have greatly benefited wheat and encouraged the growers.

Oats Reduced. — Drought in May has greatly injured oats on the entire Atlantic coast. Winter oats in the Southern States are far better than the spring crop which has been partially destroyed by drought and insects. Not only was the acreage reduced in the Ohio valley, but condition is low in consequence of dry weather. In Minnesota the injuries of drought were supplemented by those of cutworms. Condition is highest on the Northern Atlantic coast, and on the Pacific where areas are very limited.

The increase in the acreage of barley is general in almost every section where it is grown, and especially marked in the States of the Ohio valley, in Wisconsin and California. Condition is uniformly high except in portions of the Northwest where it has been lowered by drought and cool weather.

The Delaware Peach Crop.

According to our latest special reports present appearances give promise that the Delaware peach crop will be nearly an average one, aggregating perhaps about three million baskets. At present the trees are in good condition and the young fruit is vigorous and growing rapidly; and, in size, is fully up to the standard at this season of the year. Of course "the June drop" comes later; and until it is over it is not safe to make close estimates; but, judging from the past, it is not likely to be very severe. The next three weeks will tell the tale, and after that the growers will have reliable data upon which to make calculations. On the faith of the promising crop, however, the basket factories are busy at work turning out baskets by the thousands, daily, and the farmers are hauling them home and storing them away for future use. While the aggregate crop may be an average one, the bulk of the fruit will be found within a comparatively small circuit. The center of this is Dover. A line drawn from a point twelve miles north, and running west from the Delaware bay to the Maryland line, and a similar line from a point twelve miles south, will include three-fourths or four-fifths of all the peaches in the State. Most of the peaches south of that were killed by the late frost, while in bloom; and north of this central section as above defined most of the trees have been killed by "the yellows." The dependence for a crop this year is, therefore, limited to an area of less than five hundred square miles of territory. The area of demand, on the other hand, is very large, extending as far as Chicago on the West, and Canada on the North, and including the great cities of New York, Brooklyn, Philadelphia, Baltimore, Boston, and many others of less note. It is anticipated that the demand will be fully up to the supply, if not beyond it; and that prices will rule high in consequence. In support of this opinion it is further observed that the old stock of canned and dried fruit is exhausted; and that a large demand will be made by the packing houses for these purposes. Upon the whole outlook it is pretty safe to say that there will be a fair crop of excellent fruit, at good prices, and that the Delaware peach growers will be more prosperous and better pleased than they have been for several years.

In General.

A Salary with expenses paid will come handy to any one who is now out of employment; especially where no previous experience is required to get the position. If you want a position, see advertisement on Page 415, "A Chance to Make Money."

Appreciation of Wind Power.—The Goulds & Caldwell Co. report that the demand for their Decorah Steel Windmill is something unprecedented, and that it is meeting with the approval of farmers and dealers. Every one who sees it pronounces it fully up to all that is claimed for it.

Enlightening the Farmer. — I have been a reader of the AMERICAN AGRICULTURIST since 1878, and recognize the efforts of the editors for improvement and enlargement, and wish to thank you most sincerely for your efforts to enlighten the farmer in his occupation. JOHN G. PANEK.

Profitable Feeding.—Silos and ensilage are engaging the attention of our most prominent and progressive farmers, and are acknowledged by all to be very profitable. The Appleton Mfg. Co., whose attractive advertisement appears in our paper, are headquarters for Ensilage Cutters and Carriers, Tread Sweep and Tread Powers for running them.

Palmetto Asparagus.—If any larger and more handsome bunches of asparagus have ever been put up than those we have received from W. O. Shallcross, Sassafras, Md., they have not come to our notice. The stalks were twelve inches in length, and some of them measured four inches in circumference. We hope to be able to give our readers at some future time Mr. Shallcross's method of cultivation.

How to Get Foreign Help.—William Connelly, manager of the labor bureau at Castle Garden, New York city, is ready to assist farmers and others to get help among immigrants who daily land at that office. This labor bureau is supported by several immigrant associations, and is a philanthropic rather than a business scheme. Particulars of its management of help can be obtained from Mr. Connelly upon application with stamp.

In Praise of the American Agriculturist Telescope. — "The AMERICAN AGRICULTURIST telescope recently received by a member of my family," Mr. R. S. Lacey, District of Columbia, writes us, "is on my Virginia farm, in use with a much more costly field glass. Its superiority at long range is so much greater that we hardly touch the field glass now. It is an admirable instrument as well as cheap. None of the establishments in Washington will duplicate it at your price."

The Best and the Cheapest. — I consider the AMERICAN AGRICULTURIST the best and cheapest paper. It should be in the hands of every farmer, stockman and gardener, to say nothing of the host of business men interested in either of these. I have each year's numbers bound, and so have quite a library, and it proves a great comfort and pleasure, not only to myself but to every member of the family in furnishing us with good and serviceable reading during the long winter evenings, besides the valuable suggestions given about everything pertaining to the farm, garden and household. D. W. LEARY, Amelia Co., Va.

Western Farm Mortgages.—The numerous patrons of the J. B. Watkins Land Mortgage Company will be interested in knowing that by reason of increasing business the New York office has lately been moved from 319 Broadway to more commodious quarters in the United Bank Building, 2 Wall street, corner of Broadway. This company, the most conservative, strongest, and, probably, the oldest dealing in Western mortgages, has a record of which any institution might be justly proud, having repaid to investors, in principal and interest, nearly $14,000,000, and always on day of maturity. Their advertisement will be found in another column, offering some very desirable securities paying good rates of interest.

Chilled Plows —The Syracuse Chilled Plow Co., of Syracuse, N. Y., are pushing their business with unusual vigor this season, and as a result report increased sales over any former year. This company are continually increasing their plant, and during the past year have added in building and machinery over fifty thousand dollars. They have recently bought the stock, patterns, patents, and good-will of the Rochester Plow Co. This gives them a full line of first-class Gang Plows, ranging in size from a five- to a fourteen-inch cut, and in number from two to four plows to the gang. There are three different styles to each size, viz:—Field, Vineyard, and Half Vineyard. They are keeping abreast of the times in turning out hand plows in wood, iron, and steel beams, with chilled and steel bodies, single and double Sulky Plows, steel frame Spring Tooth Harrows, steel and wood frame Cultivators, single and double Shovel Plows, Road Scrapers, and a complete line of horse Haying Tools, etc. This company issue a complete illustrated catalogue, which they will mail without charge to any person writing for one.

The Future Supply of Wheat. — I have read C. Wood Davis's articles on this subject with a good deal of interest but do not agree with him about the future supply. I believe the wheat product might be increased in New York State four fold and not encroach on any other product. The best farmers in this section produce about thirty bushels per acre and can increase that so that the average yield of the State ought not to be less than thirty bushels per acre, whereas it is only about eleven bushels now. The area can be more than doubled. It is claimed that it requires five acres to pasture one cow for the season and two acres to furnish the hay. With corn ensilage and clover hay, each acre can be made to supply forage for one cow. This would give five or six millions acres for other products, and there are hundreds of thousands of acres with scattering forest trees, which have but little value, that might be cleared. Again, many of the Eastern counties that formerly produced wheat can do so again, by applying manure and superphosphate. When farmers learn to build silos and produce fodder corn to fill them, keep more stock, make more manure and use more chemical fertilizers, they can greatly increase the product of wheat and all other crops at less cost than at present, and make money by it.

JAMES MILLER, Yates County, N. Y.

Catalogues Acknowledged.

C. AULTMAN & CO., Canton, O.: A large handsomely gotten up illustrated and descriptive catalogue of steam threshers and engines.

JOHN S. CARTER, Syracuse, N. Y.: Illustrated catalogue of apparatus and supplies for cheese factories, creameries and dairies. This is a large and handsome pamphlet giving much practical information of interest to dairyman.

CHARLES DADANT & SON, Hamilton, Ill.: Circular and price-list of comb foundation, bee veils, smokers, sections, extractors, and all the various apparatus required by beekeepers.

A. W. GARDINER, Springfield, Mass.: Price-list of black and buff Leghorns and white Wyandottes.

V. H. HALLOCK & SON, Queens, N. Y.: Special list of bulbs for forcing.

H. W. JOHNS' MFG. CO., New York City: Architects' edition of the celebrated Johns' Asbestos liquid paints, with samples of all the various colors and shade manufactured by this world-renown firm.

LAWRENCE-WILLIAMS CO., Cleveland, Ohio: Circular and directions for the use of Gombault's caustic balsam—the French veterinary remedy.

WILLIAM MACNAUGHTAN'S SONS, New York City: Circular of the market reports, importation and consumption of mohair; also census reports of the Angora goats in the United States.

LOUDEN MACHINERY CO., Fairfield, Ia.: Illustrated and descriptive catalogue of the famous Louden hay tools, comprising every labor-saving contrivance in the hay field and barn.

A. H. REID, Philadelphia, Pa.: Illustrated and descriptive catalogue of creamery supplies, dairy fixtures and every apparatus required in creameries and cheese factories.

SANDWICH ENTERPRISE CO., Sandwich, Ill.: Illustrated and descriptive catalogue of windmills, pumps, heaters, feed grinders, cultivators, corn planters and carts, etc., etc.

WILLIAM SIMPSON, New York City: Illustrated catalogue of standard and registered trotting stock of the Empire City stud.

R. S. STEVENS, Attica, N. Y.: Illustrated and descriptive catalogue of the famous Maplewood herd of Holstein Friesians.

UNITED STATES NURSERIES, Short Hills, N. J.: Descriptive and handsomely illustrated catalogue of new and rare plants, also price-list of hardy perennials, aquatics, ferns and small shrubs.

VILMORIN-ANDRIEUX & Co., Paris, France: Catalogue of trees, shrubs and seeds; also seeds for greenhouses.

WHITMAN AGRICULTURAL CO., St. Louis, Mo.: Special illustrated catalogue of Whitman's baling presses for baling all kinds of fibrous materials. A handsome pamphlet of interest and value to any one interested in fibrous materials of any kind

$45.25 BUGGIES

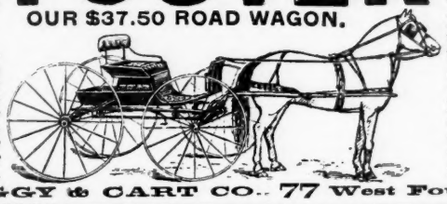
ARE NOT IN ANY POOL or TRUST COMBINATION.

We sell direct to the consumer at factory prices, and by dealing direct with us you save dealer's profit. It is a duty you owe to yourself to get the most value for your money; then why pay a dealer $25.00 more than we ask for the same quality of goods? We don't want your trade until you are satisfied that our goods are exactly as we represent them.

Address THE FOSTER BUGGY & CART CO., 77 West Fourth St. Cincinnati, Ohio.

FOSTER

OUR $37.50 ROAD WAGON.



$5.25 HARNESS

We give a guarantee with all Foster Buggies and Harness sold. Our reputation for good work at low prices is known throughout the country, therefore we can not afford to make any claims that we can not support. Our experience has been "A customer once secured is a customer forever." Write for our illustrated catalogue and join us in our efforts to kill off the pool and trust which is sucking the life-blood from the consumer.

The McCormick Land Association

LEANDER H. McCORMICK, Trustee.

A syndicate is now being formed for the purpose of handling and improving 60 acres of property in McCormick's Subdivision of Hinsdale.

CAPITAL, $150,000. SYNDICATE SHARES. $1,000 EACH.

Payable, cash	$350
Sept. 1, 1891	200
Jan. 1, 1892	250
June 1, 1892	200

The $150,000 includes $30,000 cash to be expended in improvements, $2,000 per acre being paid for the land.

LOCATION OF PROPERTY.

Within 100 rods of the depot in the most beautiful part of Hinsdale; 10 miles from Chicago city limits on C. B. & Q. R. R.; 125 trains daily: time, 33 minutes; commutation fare, 11 cents; 175 feet above the level of the lake; highest ground between Lake Michigan and the Mississippi River, Beautiful scenery and superb natural advantages. Five churches—no saloons—two public schools—high school. Higher class of improvements to be put in than in any other suburb around Chicago. Artificial lake covering 10 acres. General park improvements, flower beds, winding drives, large trees, etc. Finest street improvements, sewers, water, paving, stone sidewalks, etc.

The purchaser of a share in this syndicate will receive 1-150th of the profits realized on the entire 60 acres, which is equivalent to receiving all of the profits on 100 feet frontage, equal to 4 city lots, so the investor in the syndicate comes in on the basis of $8.00 per front foot for the land and $2.00 per front foot to be spent on improvements

The first lots put on the market will be sold at $25.00 per front foot, with every prospect of later sales being made at a much better figure, as other property in Hinsdale, farther from the depot than some of this, is now selling at $30.00 more per front foot, without any street improvements. For further information communicate with

LEANDER H. McCORMICK,

Rooms 64 and 65, Illinois Bank Building, 115 Dearborn St., Chicago.

DECORAH STEEL WINDMILL and STEEL TOWER.

The Decorah Steel Windmill has the most powerful movement ever employed in a windmill; lifts the pump rod with equal ease at all parts of the stroke; the line of draft in lifting is kept directly over the center of the lifting shaft; the coil spring governor is the most perfect of windmill regulators; **THE WHEEL AND VANE ARE MADE ENTIRELY OF STEEL.**

We guarantee our eight foot mill to do the work of any ordinary ten foot mill

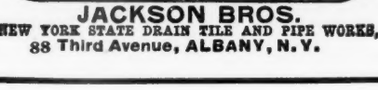
Is half the weight, costs you half the freight, and a much less expensive tower to carry it; has no crank or wrist pin, with their leverage to act against the wheel. No pitman. No dead center.

Will Run a Pump in a Lighter Wind Than Any Other Wind Mill On Earth.

"The World Do Move" See what we have to interest you before making contracts for any old time windmills.

GOULDS & CALDWELL CO., Mfrs. 22 & 24 N. Canal St. Chicago, Ill.

ROUND AND SOLE TILE Also agents for Akron Salt Glazed Pipe, Fire Brick and Cement. (Established 1852.)



JACKSON BROS.
NEW YORK STATE DRAIN TILE AND PIPE WORKS,
88 Third Avenue, ALBANY, N.Y.

THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

RICE'S STACK COVER

CHAIN CHAIN

AGENTS WANTED AND CANVASSERS

JOHN H. RICE FRANK M. RICE PATENTEE & MANUFACTURER

GENERAL AGENT, KEITHSBURG, ILLINOIS. WRITE FOR CIRCULARS.

BEWARE OF INFRINGEMENTS.

1851. INSURE WITH 1891.

The Massachusetts Mutual

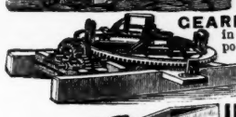
LIFE INSURANCE CO.,

SPRINGFIELD, MASS.

Massachusetts Laws protect the policy holder. Send for rates, circulars, etc.

EVERY FARMER HIS OWN MILLER

Do your own Shelling and Grinding at Home, saving tolls and teaming to and from the Grist Mill. This work can be done rainy, windy days, when out-door work is suspended on the farm. The same Mill will cut corn stalks, saw wood, run churn, grindstone, pump water, etc. We make the



HALLADAY GEARED WIND MILL in 11 sizes, 1½ to 40 horse power, and GUARANTEE they have no equal for Power, Durability and Storm-Defying Qualities.

Horse Powers and **JACKS** both single and double Geared, made heavy and strong.

IXL 2 HOLE CORN Sheller

Adapted to run by hand, horse, steam or wind power. Not cheaply made, but strong, durable and effective in its working, yet light running. It is constructed similar to the large Power Shellers, and is the best 2-Hole Sheller on the market.

SAW TABLES

Both Swinging and Sliding Tables. We make a Saw Table especially adapted to sawing long poles. Special care is taken to make these machines strong and durable.

THE IXL STALK CUTTER

made in 5 sizes, with **Safety Fly Wheel, Safety Lever,** and all late improvements.

THE IXL IRON FEED MILL

3 sizes, both Belt and Geared Mills. Can be run by any power, and especially adapted to Wind Power. Will grind any kind of grain, and is the lightest running and most effective Feed Grinder made.

IXL TANK HEATER

For warming water in Stock Tanks. Made of the best quality of iron cast in one piece, no sheet iron to rust or solder to melt and cause leak. Will burn any kind of fuel. It is very effective and takes less care to operate than any other Heater made.

We also make the **HALLADAY PUMPING WIND MILLS** 18 sizes; 8 to 60 ft. diameter, and one man to 40 horse power. The **U. S. SOLID WHEEL WIND MILL,** 7 sizes. **Iron and Brass Pumps** in great variety. **Tanks** all kinds and sizes, and the **Standard Hay Tools** consisting of **Anti-Friction, Swivel, Reversible** and **Rod Hay Carriers, Harpoon** and **Grapple Horse Hay Forks, Pulleys, Floor Hooks, etc.** All goods fully guaranteed. Send for Catalogue and Prices. **Reliable Agents wanted** in all unassigned Territory.

U. S. WIND ENGINE & PUMP CO.,
BATAVIA, ILLINOIS, U. S. A.
BRANCH HOUSES:—Kansas City, Mo.; Omaha, Neb.
DEPOTS:—Boston, Mass.; Fort Worth, Texas.

CANE MILLS.

More kinds and sizes of Mills and Evaporators, for Sorghum and Sugar Cane, are made by **The Blymyer Iron Works Co.,** of Cincinnati, O., than by any other works in the world. They are the *sole makers* of the *Victor, Great Western* and *Niles Mills,* the *Genuine Cook Evaporator,* and the *Automatic Cook Evaporator.* Send for Catalogue, Prices, and The Sorghum Hand Book.

"Money makes the mare go," and a little breeze operates the **Ideal Junior**—a little money buys it. Ask for catalogue free.

STOVER MFG. CO.,
510 River Street, FREEPORT, ILL

ANIMAL AILMENTS.

Scab on Sheep.—Ranchman, Las Vegas, N. Mex.: There is little use of trying to cure the scab on your sheep before shearing, but as soon as the fleece is removed prepare tanks and tobacco water and dip the entire flock. This is the most reliable remedy for scab, which is due to a minute parasite, a kind of itch mite. You can find a full description of this operation with illustrations in "Stewart's Shepherd's Manual," besides much other useful information in regard to the care of sheep. If you do not cure the scab this spring your sheep will not only suffer greatly next fall but may lose the greater part of their wool.

Worms on the Tongue of Cows.—B. A. Wharton, Sussex Co., Del., has two Devons, and one Jersey that are so troubled with "worms on the tongue," that they lose flesh and fall off in milking. He has had the tongue scraped with a dull case knife and rubbed with salt, and the "worms became more numerous." The tongues of the cows have irritation and enlargement of the *papillæ*. There are no worms on cows' tongues. The food may be irritating and undigested to a degree. Change the food, give roots once daily, a handful of whole flaxseed in dry bran once daily. Moisten the hay fed an hour or two before feeding. Put five pounds of Glauber salts in a large bottle, add warm water gradually until the salts are dissolved, no more water than just necessary to effect this. Then give each cow at every meal a half teacupful of the solution in the food.

Scaly Eruption—Calking Cuts.—Thomas A., Clinton Co., N. Y., has a ten-year-old horse that has scaly eruptions on the back part of feet below the fetlock. The exciting cause is the irritation from dirt, or neglected scratches. Cleanse night and morning with soap and water, dry well, and apply carbolic ointment by thoroughly rubbing in with the hand every night for a week or longer. Should this fail—it probably will not—wash as directed and apply an ointment of biniodide of mercury every two or three days upon the forefinger and rubbed in as previously. The hands should be wiped clean with paper or flannel after the application, and washed with soap. Horses properly shod should seldom cut themselves in winter or summer. The blacksmith and the driver, though both much abused personages, are often to blame in the occurrence of calk cuts. These, like other wounds, should be treated on common principles. Poulticed or fomented if bruised or inflamed, and kept clean and dressed daily with simple cerate.

Cough in Horse and Feverish Feet.—Henry Warren, Providence Co., R. I.: For the cough of mare, tar water should be given, and a handful of flaxseed in the feed. A quart of tar to a barrel of water, thoroughly stirred, will make a good drink for the mare. She may refuse it at first but, by withholding water from her, she will drink it. If necessary, give daily the following ball:

Tar an ounce, linseed meal sufficient to make six balls.

If the cough persists, rub spirits of turpentine along the line of the windpipe for a foot or more every two or three days, and continue the other treatment. Horses having feverish feet, or feet disposed to contract, should stand on a ground floor kept damp. To dampen a ground floor, spread over it old straw litter and wet it with a watering pot thoroughly when the horse is out of the stall, and let it remain thus wet till night when dry litter should be substituted. Peat moss is imported from Germany, and, when moistened and has coal tar mixed with it, it makes a good application for feverish and contracted feet of horses.

Molting.—Subscriber, Washington. D. C., desires to know how often animals molt. The horse sheds its coat once a year in all countries. But in our climate the partial molt again occurs in the fall. The thorough molt, in most domestic animals, occurs in the spring. The fall molt is only partial and is more of a longer growth of the coat and thickening for winter protection. This thicker coat is coarser and not so brilliant and glossy as the spring coat. In horses the mane and tail do not molt. Young poultry molt in spring, and at this season the fowls are feverish and unfit for food. After the third year hens molt later. Poultry generally suffer more and more in molting the older they become. It is this severe molting fever that kills so many old fowls, and especially if roupy. Our songsters put on the gay and brilliant colors of courtship, and their song is most musical in love-making. Though melodious birds sing sweet madrigals and dress in gay plumage, they soon after assume the homelier garb of everyday life. Some animals change their coats in different seasons to assume the natural colors of surrounding objects at the different seasons of the year, as a protection against their natural enemies. This change of plumage gives at different periods special names. The brilliant colors of the Bob-o-link are changed to somber gray, and his metallic notes to the vulgar chirp, and when plump and fat on rice his name is changed to Rice bird.

Giving Medicine to Hogs.—Pigs make more noise about taking medicine than children. The illustration herewith shows the most efficient means of securing large pigs for the administration, but even when thus secured they will struggle and squeal, and spill the remedy if possible,

DOSING A PIG.

but with the head thus raised and secured a little tact will accomplish the object aimed at. A sick hog is more stupid and stubborn than a well one, and inquiries are frequently made how to give medicine to hogs. This sketch will answer the question better than a long description, and the method will not be readily forgotten.

A Manger-Eating Horse.—Nearly all horses get the habit of biting the post, rail, fence, or tree to which they are tied, and such habits are so industriously practiced in the stable that the manger and woodwork are sooner or later demolished. Mr. J. A. Gillen, Philadelphia, desires to learn how to prevent the effects of this habit. As less or more feed, less or more work will not do it, iron mangers, racks, fastenings, and fenders will at least save the marring and damage to the stables. We give herewith an illustration of a fastening (Fig. 1) that will prevent horses from doing damage anywhere. Two rings with ropes and snap at lower end fastened so far apart as to hold the horse's head from reaching anything to bite is a good remedy or guard. High posts with a long cross-bar having the above fastenings, as seen in Fig. 2, will save the destruction of young shade trees, posts, fences, and valuable fruit trees. Unless trees are boxed eight or ten feet high, unrestrained horses will injure them. The habit originates in the practice of unnecessarily confining or imprisoning the best and most faithful friend of of man, the horse. Box stalls with iron rack and manger will doubtless modify the habit of the horse in eating the woodwork of the stable. A variety of feed will also often ameliorate this harmful disposition. In summer, every stabled horse should get frequent bites of grass.

FIG. 1. HOLDING IN A STALL.

FIG. 2. POST FOR HOLDING.

Snuffles in Pigs.—Mrs. Annie A. Ramsey, O'Brien Co., Iowa, writes: "Can you tell us what ails our pigs and what will cure them. They have spells of sneezing first, and then the nostrils swell so they cannot suckle, and they waste away till they die. In some cases the eyes become inflamed. We have lost nine or ten of that disease." This ailment is known as snuffles. It is an inflammation of the mucous membranes of the nose and eyes, caused by some irritating substance, or filth, cold and wet. Sows wallowing in wet places having poison oak or sumac have thus poisoned suckling pigs. Change to a clean pasture and give two grains of sulphate of copper dissolved in a teacup of water in the milk if the pigs eat, night and morning. If too young to eat from the trough, give the sulphate of copper in milk. Half a dram of sulphate of copper to a quart of water may be used internally in tablespoonful doses, and the same solution may be injected into the nostrils once daily. Pigs, like children, make a great outcry at taking medicines, and fight against any force except that which is absolutely overpowering from the outset. Pigs, also, like children should be kept clean in early infancy.

Col. Frank D. Curtis.

In the death of Col. F. D. Curtis, which occurred on May 29, at Cuba, N. Y., the dairymen of the country have lost one of their stanchest and most useful friends, while those who live in the State of New York, where most of his special labor was performed, will miss his genial face and wise counsel at their meetings and the ever watchful care he had over their interests. For the past fifteen years Col. Curtis has been a conspicuous figure in the progressive march of dairy science in this country. He was emphatically a man of affairs, a natural leader, and he had his whole soul enlisted in the dairy cause. He not only gave it his sympathies but, being a man of action, he was always found foremost in the fight. The institutions we now have in this State that are such a source of pride to the farmers, the experiment farm at Geneva, the dairy school at Cornell, the farmers' institutes, the dairymen's association, are all either indebted to him for their existence or the help that assures success.

As a writer upon dairy and general farm subjects there was no man's pen that commanded greater respect and found more careful readers. There was always sure to be something new, fresh and original in his views, while his cheerful and graceful style charmed the reader. He was a frequent and most esteemed contributor to the columns of the AMERICAN AGRICULTURIST. Probably the last article he wrote, and which will appear in a forthcoming number, was received but a few days before his death. His manner of public speaking was easy and convincing. He moved his hearers from serious and practical argument often to the highest flights of heated eloquence when his soul burned at some crying wrong, or when the subject was less serious there was a generous humor in his style that prepared every one for a merry time.

Great and diversified were his talents. His integrity was above reproach and his usefulness beyond measure. His neighbors had learned to honor and love him, for he was most energetic and enterprising in their behalf. His State knew him as an efficient public officer, while the Legislature took him into its confidence on all occasions when farming interests were under consideration, for he was a wise and trustful counselor. The country at large, in his death, has lost a citizen worthy of the high honors he held, a Christian gentleman whose example remains with us to prove that there are lives it is a pleasure and an honor to live.

Kind Words.

A Great Educator.—The AMERICAN AGRICULTURIST is always full of valuable reading. It has been such a great educator in our family that we would not be without it for anything.

W. A. KUGLER, Union Co., Ill.

Issues of the Day.—The AMERICAN AGRICULTURIST is the best agricultural journal published. I am particularly pleased with the "Issues of the Day" contained in it.

GEORGE HICKMAN, Leota Co., S. Dak.

Appreciation in Jamaica.—There is no money that I pay with so much pleasure as my subscription to the AMERICAN AGRICULTURIST. Although I am engaged in a bank and my farm consists only of a small flower garden, I would not give up the AMERICAN AGRICULTURIST on any account.

T. A. SMITH, Kingston, Jamaica.

Keeps Up with the Times.—The AMERICAN AGRICULTURIST has been a member of our household for the last thirty-two years, which may be accepted as an assurance of our high appreciation of the merits of the paper. It always keeps well up with the times, which is not an easy thing in this progressive age.

THOMAS H. COLE, Bristol Co., R. I.

Mushrooms: HOW TO GROW THEM!

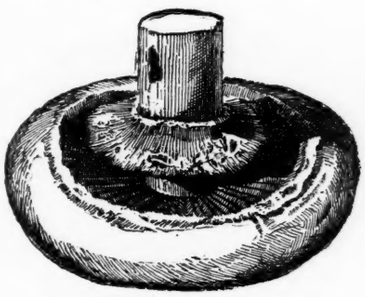
A Practical Treatise on Mushroom Culture for Profit and Pleasure.

By WILLIAM FALCONER. ILLUSTRATED.

The author has devoted many years to the practical cultivation of Mushrooms, both here and abroad, and few persons have had so many opportunities of studying the various phases of this subject.

The best work on the subject ever written, and the only book on Growing Mushrooms ever published in America.

The whole subject is treated in detail, minutely and plainly, as only a practical man actively engaged in Mushroom growing can handle it.

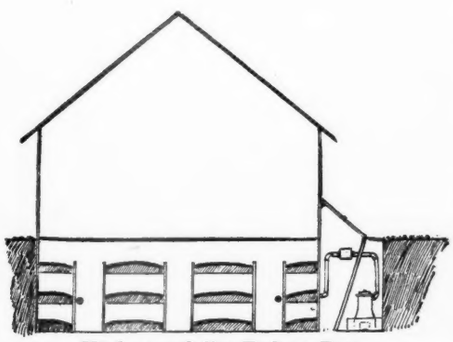


A PERFECT MUSHROOM.

For table use, fresh Mushrooms are a delicious, highly nutritious and wholesome delicacy; for market they are less bulky than eggs, and, when properly handled, no crop is more remunerative.

The demand is steady and increasing in all the large centers.

Any one who has an ordinary house cellar, wood shed or barn can grow Mushrooms.



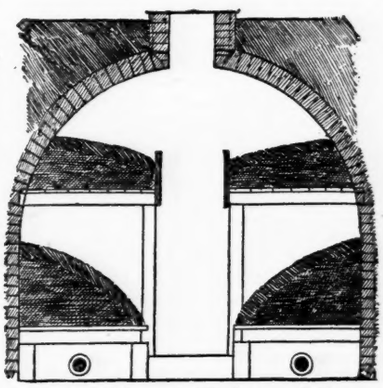
Mushroom Cellar Under a Barn.

Among the specialties in market gardening, mushrooms have always taken a prominent position in European countries.

The magnitude of this industry in England and on the continent is something enormous and the mushroon crop is one of the most profitable that can be grown for discriminating markets. It requires less cash outlay, less labor, hence less time, than almost **any other crop,** and would **prove a great additional source of income to our people** if they would become interested in it.

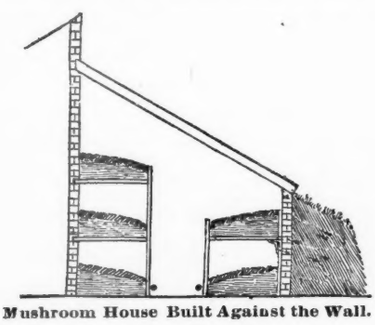
In the United States, while here and there mush rooms have been grown with success, the majority of people who were favorably situated for their cultivation have remained in total ignorance about the methods of growing this delicacy. As a principal cause of this may be assigned the reason that heretofore no book on mushroon culture in America has ever been published. This new work by Mr. Falconer will therefore be welcomed as a most valuable addition to our horticultural literature.

Not only is this book replete with information of value to those who grow mushroons for their own table only, but it also contains full information for growing the plant for market.



Section of Dosoris Mushroom Cellar.

Every direction, from preparing the bed, planting the spawn, and gathering the mushrooms, on a small or large scale, down to their culinary preparation are so fully and clearly treated that **any person who never saw mushrooms** even could follow these **directions with immediate success.** Ample directions are given for **raising mushrooms in the open field, in the cellar, in the greenhouse,** and in **houses built expressly for the purpose.**



Mushroom House Built Against the Wall.

The construction and interior arrangement of mushroom houses and cellars is treated at length. The best and cheapest methods of marketing the crop are given full consideration.

The cultivation of the plants in the famous Paris caves as well as in open ridges around London is vividly described.

The diseases of mushrooms,—for like all other plants they have some insect and vegetable enemies,—are given **full attention,** and the **best plans** for **prevention and cure** are clearly presented.

The chapter on cooking, drying, pickling, preserving and making ketchup of the mushrooms is in itself well worth the price of the book to the intelligent housekeeper.

Interior View of a Mushroom House.

To the many thousands of farmers as well as suburban residents who are trying to find a **comparatively easy employment** by which they can raise a crop which **sells readily at paying prices,** the **study of this work** will open **new and promising opportunities.**

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More From the Stations.

ALABAMA — No. 24, pages 16. In this bulletin upon dairying and breeding several maxims are laid down. Feed the cows twice a day, with pure water and salt always accessible. Use no dog. A dairy cow does not need the exercise of a trotting horse. A cow with a good escutcheon and nothing else should be butchered. Color of skin is not a true index to color of butter. A cow likes a variety of food, therefore gratify her taste. Stick to the breed chosen. A thermometer is more reliable than a wife's forefinger. It is impossible to be too clean. Cotton seed fed alone spoils the flavor. The patent butter maker with county rights is a fraud. The dairy is a restorer of land and an educator of the people.

KANSAS—No. 17, pages 26. In this report of the crossing of varieties of corn for the second and third years it is stated that the effect of the cross is visible in only a few cases the first year, but the second year shows generally ears more or less completely blended between the two parental types. Rarely the grains of an ear are unlike each other. The product of the third year is generally true to the seed planted, and by selecting for seed the grains desired for that form or quality the strain can usually be perpetuated. Desired points of improvement can therefore be fixed by selection through crossing. A plate (full page) is given, showing crossed ears of various sorts.

KENTUCKY—No. 33, pages 16. The results with corn experiments are almost identical with those of the last two years. With potash there was a marked increase of grain and fodder, and the greatest yield was by using a combination of potash and nitrogen. There was always a profit where potash was used as one ingredient of the fertilizer, but the greatest when nitrate of soda and muriate of potash was used. The potash fertilizers show their effects the third season after application. This series of corn experiments extending over three years is a clear case in favor of potash fertilizers.

NEW YORK—No. 28, pages 12. In the pig feeding experiments with coarse foods it was found that sorghum, oat and pea forage and mangolds may be economically fed with grain and possibly be a substitute for a large part of the ordinary grain ration. No profit was found in feeding corn ensilage, prickly comfrey or clover in large proportions. Clover only was profitable when it constituted less than a quarter of the water-free food. Mangolds and sorghum admit of being fed with highly nitrogenous grain foods as linseed and cotton-seed meal, and deserve further trials.

NEW JERSEY, No. 76, pages 32. The fungous diseases of the sweet potato are treated in this with nineteen engravings of the various troubles. The leading rots are the soft rot, black rot, soil rot, stem rot, white rot, dry rot. To these are added the scurf and a mold and a blight of the leaves. The worst pests are the black rot and the soil rot, both of which cause much damage to the crop in New Jersey. Both are caused by low forms of fungi, the black rot spreading from the sets of the hotbed while the soil rot is an infection coming directly from the soil as the name suggests. As with all underground rots remedies are applied with difficulty. For the black rot it is important to use healthy "seed" for sprouts, discard all spotted sprouts, and possibly something can be done to the land as a preventive. In case of the soil rot it seems wisest to abandon sweet potato growing upon badly infested soil for a term of years that the germs may starve out.

No. 77, pages 36. This gives the results to date of experiments with different breeds of dairy cows, namely, with Ayrshire, Guernsey, Holstein, Jersey and Shorthorn cows obtained for the purpose of leading clubs of the several breeds. The experiments were suddenly interrupted by the burning of the entire herd on November 2. A difference in the amount of total solids in the milk of the breeds was accompanied by a corresponding variation in all the compounds except sugar, which was constant. The average per cent of total solids was lowest for the Holsteins and highest for the Jerseys, but the yields of milk were greatest for the Holsteins, and least for the Jerseys, so that the daily average of total solids was most for the Holsteins. There are many interesting results that can only be shown by the tabulated results displayed in the bulletin. All the breeds do not present the same points for comparison, but are divided into the milk class and the butter class.

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The Walking Hogs.

DR. A. G. CHASE, KANSAS.

I was called to examine a small herd of hogs recently afflicted with what might well be called walking insanity; I found seven or eight shotes of a hundred pounds weight, and two or three grown animals in a pen, of say, 40x100 feet. All the young animals were walking in one direction, around the lot, at rather a fast gait. There was no staggering motion but a good square walk, but with the head down. When a person stepped in the pen they would come right up to him if he were in their line of march, but if he did not step out of their way they would turn out, showing that they could see. In turning corners if two or more collided so as to check the walk, they set up a squeal until motion was resumed, otherwise they made little noise except an occasional grunt. When I saw them this walk had been kept up so far as we knew from daylight to one o'clock p. m. They refused food entirely although a part of them had eaten a small portion of lard, which the owner fed them in the morning. During the forenoon some of them had vomited, all of them in fact but two. The next morning they had all recovered except the two that did not vomit and those two were as stiff as a badly foundered horse.

The explanation of this disease is simply here. The son and part owner of the herd thinking to do a kindness to his hogs went into the creek bottom near by and gathered a sackful of a rank weed variously known as "crow's foot, horse weed," etc., and a weed used by some families for "greens" in the spring, and fed it to his hogs. They ate it greedily, which I do not think they would have done had they not been starving for green stuff; and the hogs that vomited threw up great masses of this green stuff. There is a species of this plant called crow's foot, that I know from personal experience to be an irritant poison, and I think he happened to get this chiefly. Twenty odd years ago my family and another were dangerously poisoned by it. But the case has points of interest to the hog raiser.

Tax Reform in Vermont.

J. E. GALE, VERMONT.

The cause of Vermont's abandoned farms is attributed by Mr. Bell in the AMERICAN AGRICULTURIST for April to its thorough system of tax laws, and especially those portions relating to the taxation of personal property. The present law, which was enacted in 1880, was intended to relieve the farmers and real estate owners of this State by forcing moneyed men and corporations to return to the listers sworn statements regarding their property, and imposing such penalties for infraction of the laws that only a very small per cent dare fail to comply. The new law is based on the principle of taxing a man or corporation on what he actually owns—whether real or personal estate makes no difference—and is regarded as oppressive only by selfish capitalists and chronic tax-dodgers. Under the old law the farmers, being unable to conceal their real estate from the view of the listers or assessors, paid the greater share of the State tax, and at the time of the enactment of the corporation tax law it was promised that the reveneu from this source should defray all State expenses, and with economical legislation it would do so. In order to aid widows and orphans, savings bank deposits to the amount of $1,500 are exempted from taxation. Personal property belonging to persons in debt is also exempted to the amount of the debts owed; but real estate, even if mortgaged, must pay taxes, and as the holder of a mortgage is also taxed on the same, this amounts virtually to double taxation, and is the weakest and most oppressive point in the new law, and one which should be remedied.

National and not local taxation is the cause of Vermont's abandoned farms. With the proceeds of his products sold in the cheapest markets of the world, the Vermont farmer is unable to live and pay the exorbitant prices for farm machinery, clothing, and necessaries which have prevailed for the last quarter of a century.

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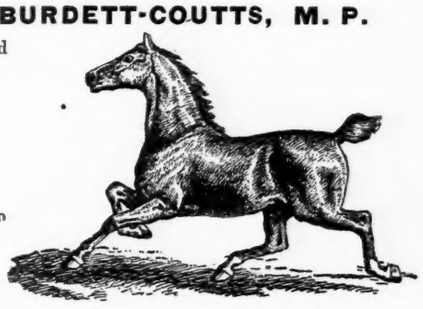

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Contents of This Number.

Agricultural Production, Permanency of (C. Wood Davis)....414
Allium, Neapolitan, The....*Illustrated*..393
Animal Ailments....420
Asparagus Plants, An Easy Way to Grow (J. K. Reeve)..396
Asparagus, Cutting....411
Basket Items....410
Begonia Disease, New, A (Prof. T. B. Galloway)....3 *Illustrations*..393
Bessey, Prof. Charles E....*Illustrated*..409
BOYS AND GIRLS:
Why the Bell Was Silent (Katherine Hamilton)....2 *Illustrations*..403
Don't Play Rude Jokes (Nellie Burns)....404
Our Puzzle Column....404
Odds and Ends from the Patent Office (E. A. Matthews)....404
Blackberrying (A. M. George)....*Illustrated*..405
Bulbs, Summer Flowering, Two Good...2 *Illustrations*..397
Caterpillars, Tent....411
Cattle, Galloway (Richard Waugh)....*Illustrated*..383
Cane Sugar Prospects with Bounty (T. M. Cage)....379
Collards and Cabbages for Warm Climates (W. F. Massey)....*Illustrated*..395
Corn, Indian, Improving (I. J. Farmer)....379
Corn Fodder....410
Curtis, Col. Frank D....420
Elm Leaf Beetle, Imported, The (Prof. C. V. Riley)....2 *Illustrations*..384
Evergreens, Summer Pruning of (Walter Dalton)....393
Farming in Foreign Lands....408
Forage Crops, Home-Grown (Hollister Sage)....384
FROM NEAR AND FAR:
The Great Salt Lake....406
The California Orchards and Vineyards....406
The Range Industry in Utah....406
Bright Prospects for South Dakota....406
A New Fruit Region....406
Home Life of Northwestern Indians....*Illustrated*..407
Washington Wheat and Potatoes....407
Fruits, Cultivating for Flavor (Webb Donnell)....396
Fruit Trees, Unfruitfulness of....382
Geese, White Chinese....*Illustrated*..381
Grass, Orchard, Value of, The (Prof. W. F. Massey)....390
Grasses, Wild, on the Plains....386
Great Discovery, A....412
Hay, Make While the Sun Shines....*Frontispiece*..378
Hay-Rack, Improved Form of....2 *Illustrations*..382
Hedges, Training, New Method of (J. G.)....396
Hogs, Giving Medicine to....*Illustrated*..420
Hog, The Walking....423
Horses, Shire, in America....*Illustrated*..385
Horse, Manger-Eating, A....2 *Illustrations*..420
House, Convenient, for One Hundred and Fifty Fowls....2 *Illustrations*..382
HOUSEHOLD:
True Pictures of Country Life (S. Jennie Smith)....398
Impure Water—How to Recognize it (D. Webb)....398
Baby's Corner Lot (Annie H. Donnell)....398
For the Writing Desk....*Illustrated*..399
A Horseshoe Pen-Rack....*Illustrated*..399
Parlor Novelties (Anna Hinrichs)....4 *Illustrations*..399
Arranging Flowers (Margaret Kennedy)....399
Irish Star Lace (Frances H. Perry)....2 *Illustrations*..400
A Combined Table and Commode (W. D. Worcester)....2 *Illustrations*..400
A Bronzed Picture Frame (Mrs. M. J. Gorton)....*Illustrated*..401
Ladies' "Adjustable" House-Dress (F. P. Scribbler)....2 *Illustrations*..401
Tasteful Notepaper (Ella Rockwood)....401
A Rustic Ornament for Summer Homes..*Illustrated*..401
Summer Fancies....402
In Canning Time....402
Hot Weather Cookery....402
Library Corner....416
Midsummer Musings....394
Milk Test, Reliable, A. (G. Johns)....383
Nitrate of Soda versus Sulphate of Ammonia (J. J. Willis....392
Note Book, Farmer's A. (J. C. Umsted)....386
Outlook, Summer, The....418
Pastures, Supplementing the....390
Pacific Coast, Injustice to the, An....412
Peach Crop, Delaware, The....418
Poultry in the South (H. S. Babcock)....390
Poultry Points (John W. Caughey)....280
Primroses and Pansies (May Frost)....397
Quamash, The....*Illustrated*..393
Rabbits Trapping (John C. Umsted)....*Illustrated*..382
Rain-Gauge, Australian, An....*Illustrated*..388
Ramie Plant, Cultivation of the (W. H. W. Campbell)....*Illustrated*..387
Refrigeration, Artificial (N. R. Briggs)....389
Rennets, About (G. E. Newell)....384
Roadside, Plea for the, A....412
Science in Farming....409
Sheep, Money in (F. K. Moreland)....386
Silage, Facts and "Fancies" in (John Gould)....378
South, New, The....388
Swine, Small Yorkshire....*Illustrated*..384
Stations, More from the....422
Tax Problem, The (Charles L. Hill)....414
Tobacco, American Havana (Frank Phillips)....390
Vermont, Tax Reform in....423
Wagons, Bottom Plank for, Convenient....*Illustrated*..388
Walnut Groves, Among the (Charles H. Shinn)....2 *Illustrations*..391
Weeds, Prairie, Troublesome (Prof. L. H. Pammell)....2 *Illustrations*..387
Yokes, Neck, Three Kinds of....3 *Illustrations*..388

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